

REV.

LERA LESLIE E. ROBERTSON ASSOCIATES, RLLP
CONSULTING STRUCTURAL ENGINEERS

P

DRAWING NO.

DRAFT

DESIGN

CHECK

WTC

PLANNING

BOOK

19

K-1056 / UP

K-107P / 26

1d

132018

13441155

MSC

1-11-11

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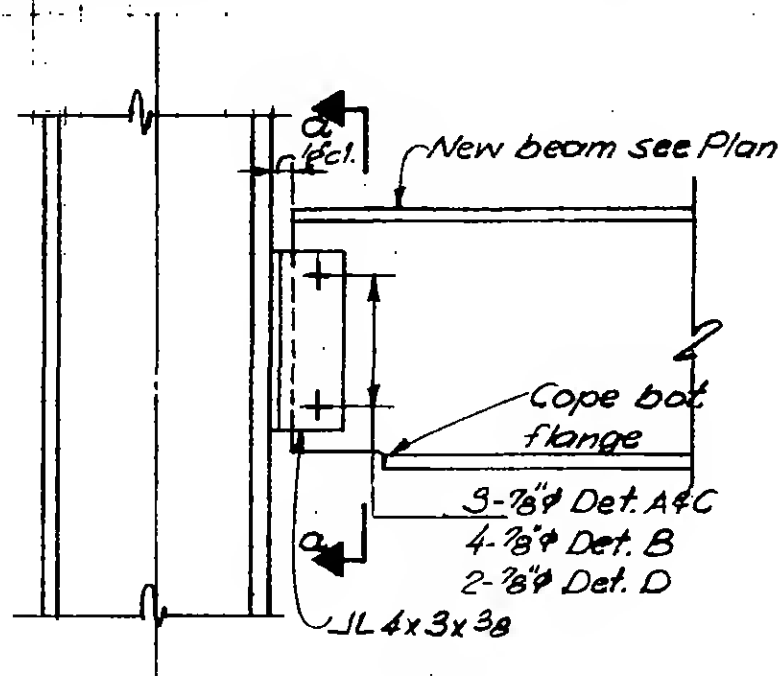
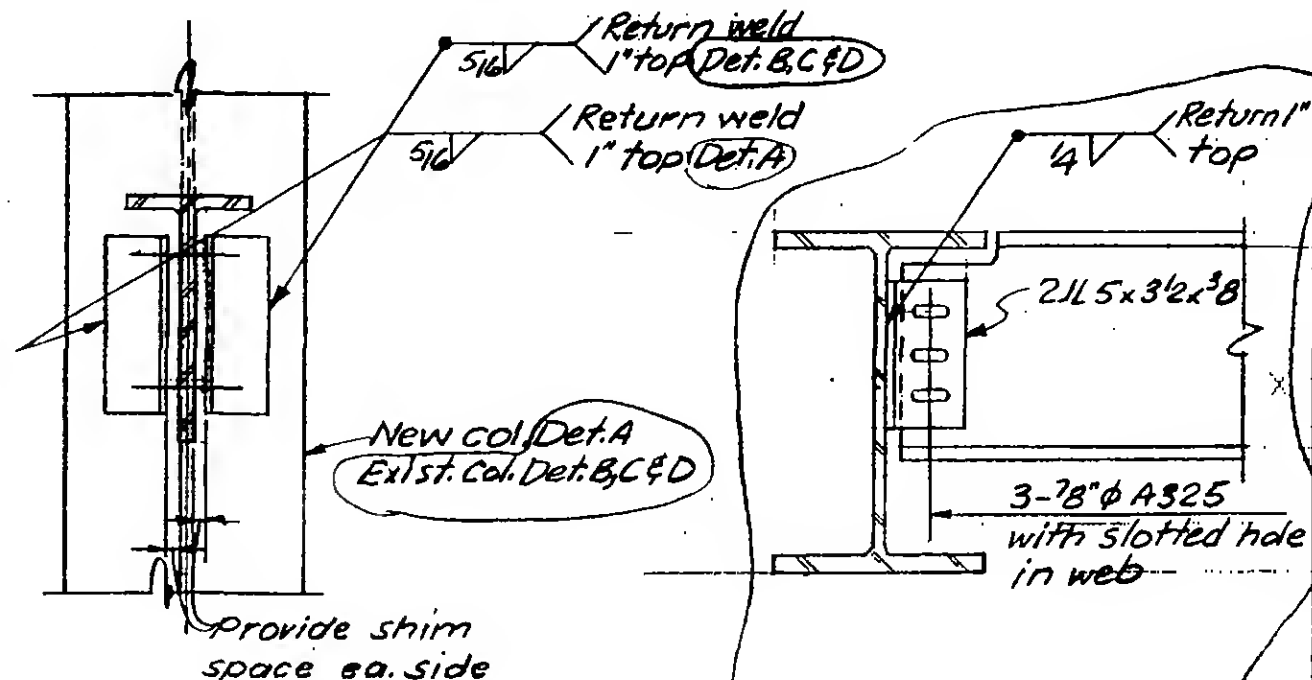
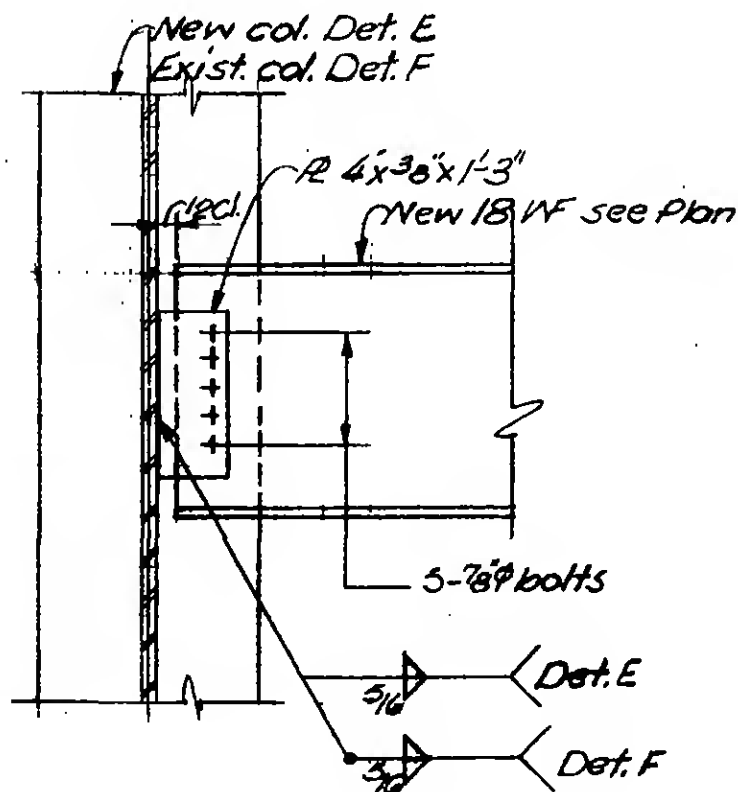
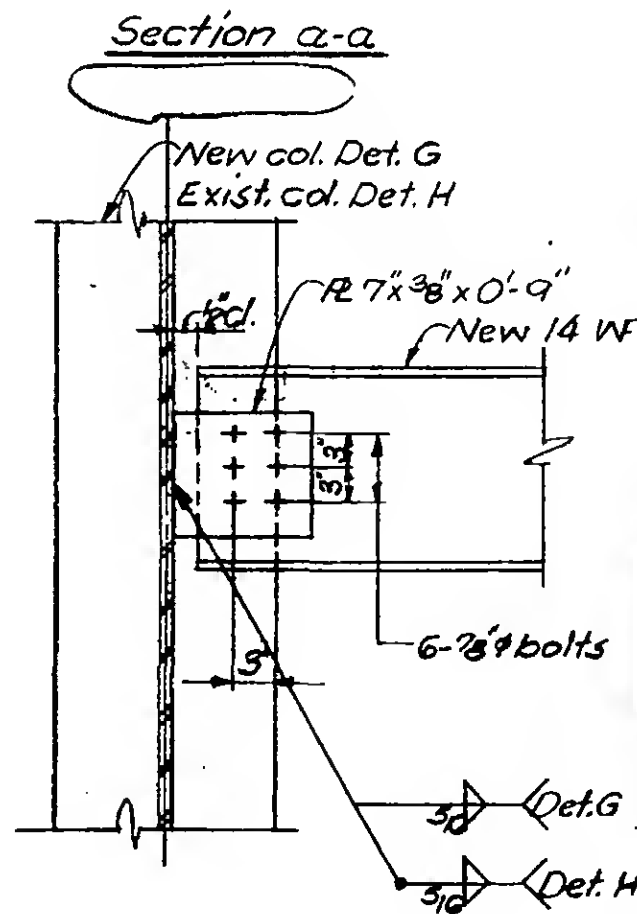
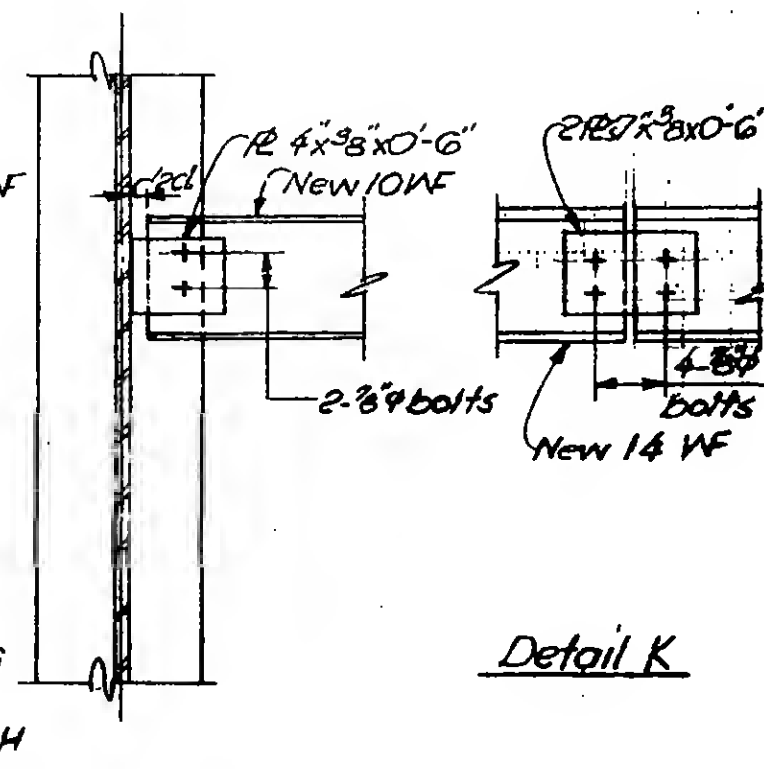
PROJECT THE WORLD TRADE CENTER

TITLE BEAM CONNECTIONS MEZZ. EI. 320'-0"

DATE 1-16-72

REVISIONS

10/10/72

Detail A, B, C & DDetail MDetail E & FDetail G & HDetail JDetail K

All bolts A325



DESIGNED

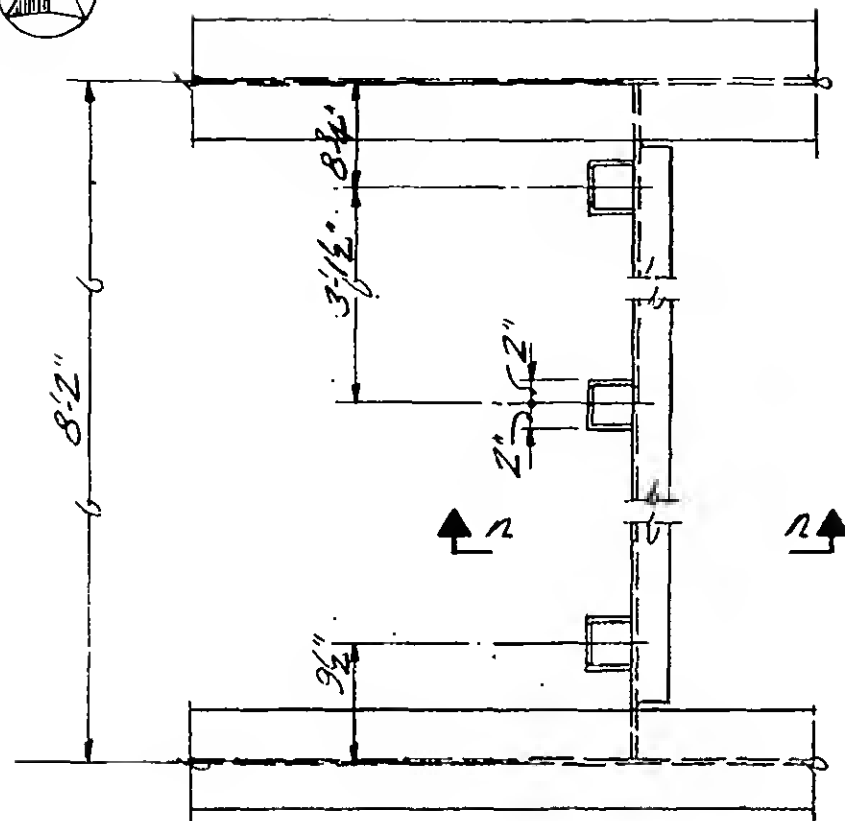
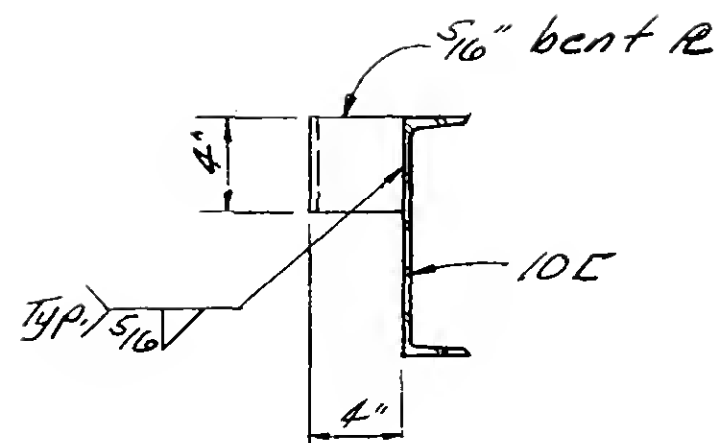
DRAWN

REVIEWED

R-K-105G.1

REVISIONS

NORTH

Plan Detail NSection n-n

DESIGNED

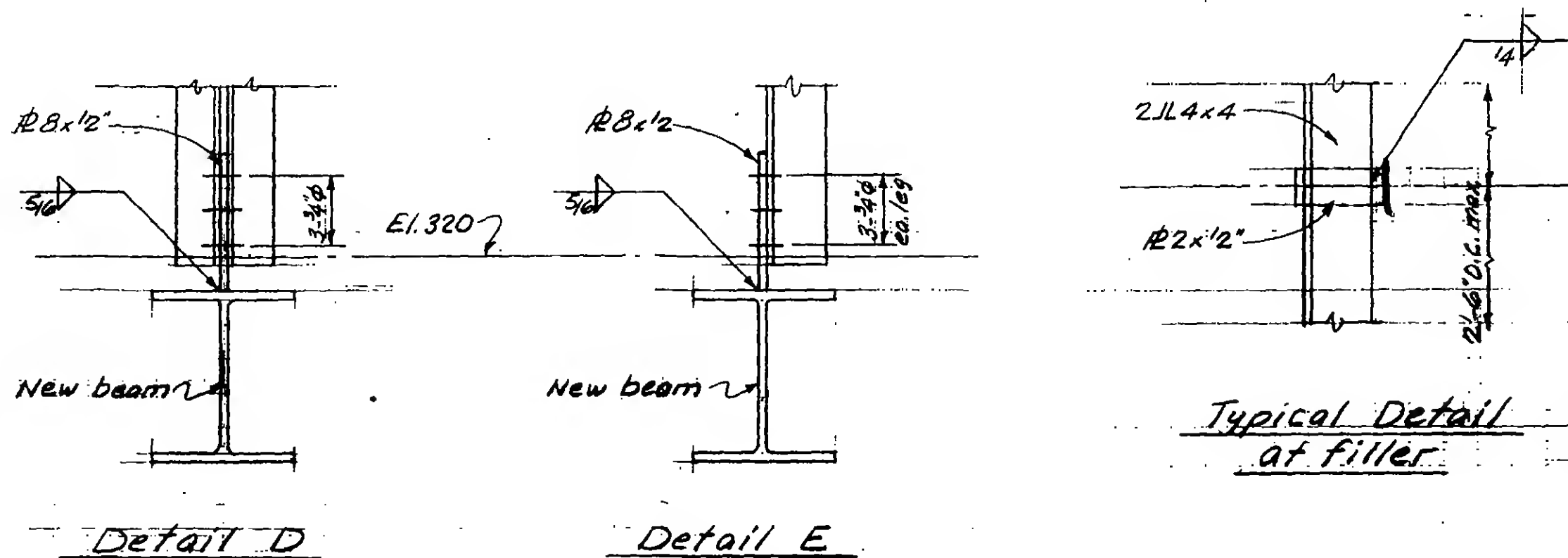
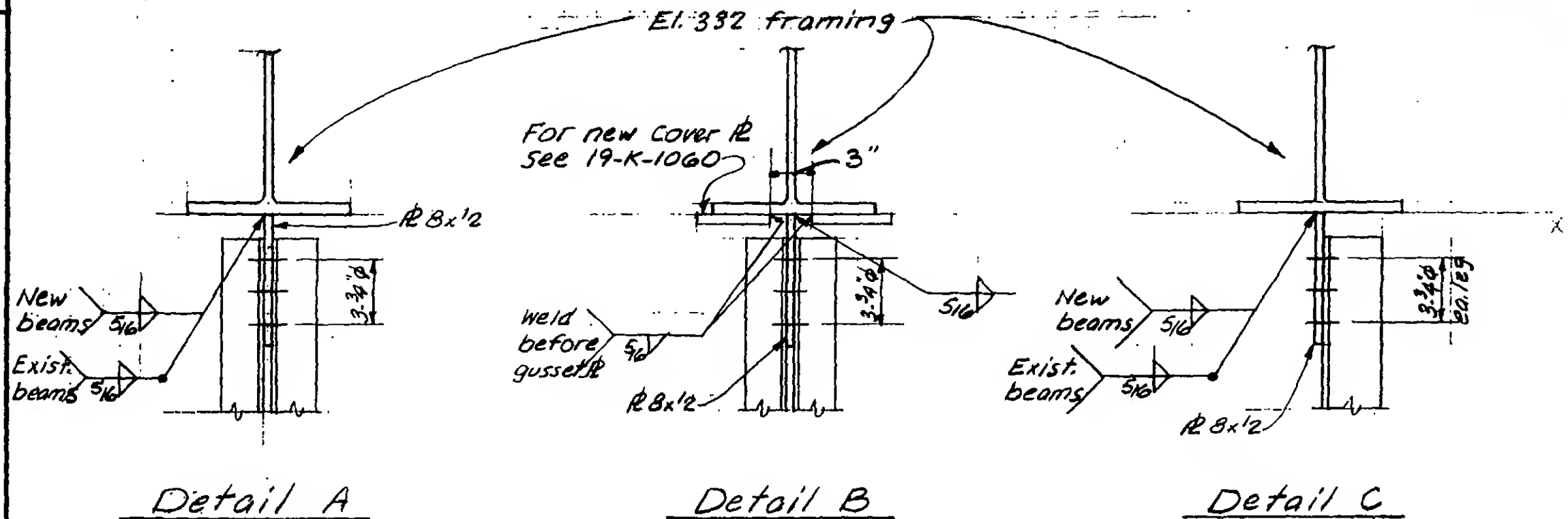
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REVIEWED

19-K-1056.2

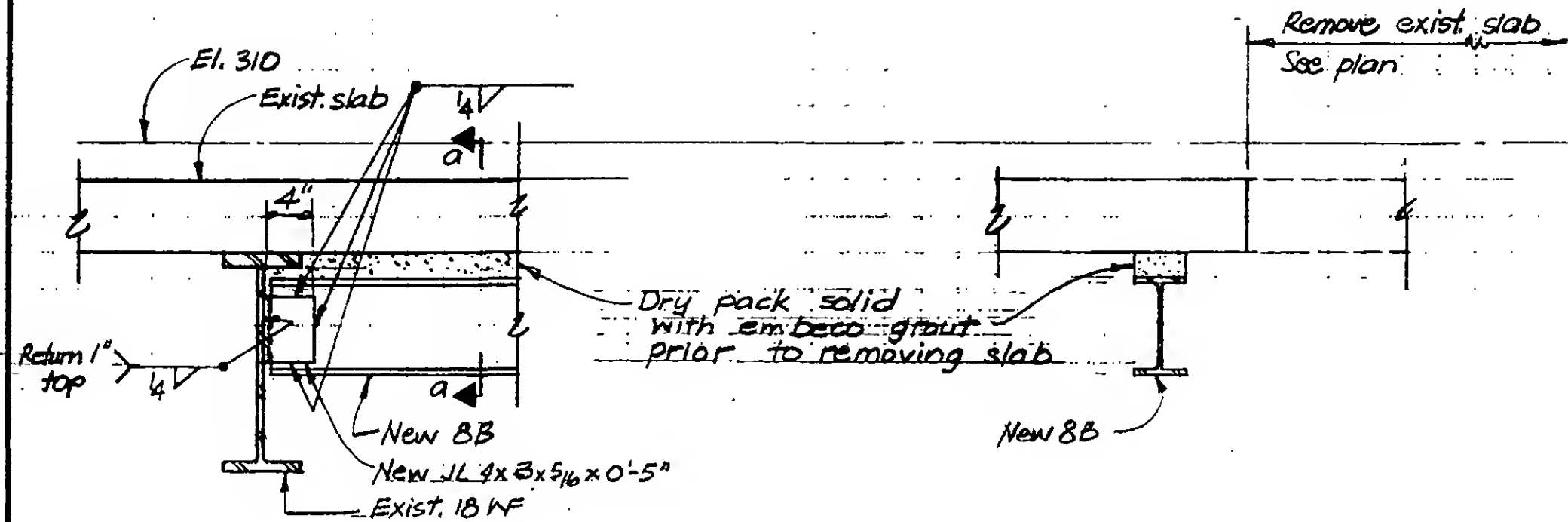
PROJECT THE WORLD TRADE CENTERTITLE HANGER DETAILSDATE 1-15-72

REVISIONS

DESIGNED
W. BREWERDRAWN
A. ERANDUIREVIEWED
W. Brewer

19-K-1057

REVISIONS

Detail ASection a-a

DESIGNED

P. M. O'Neil

REVIEWED

D. Brewer

19-K-1058

PROJECT

THE WORLD TRADE CENTER

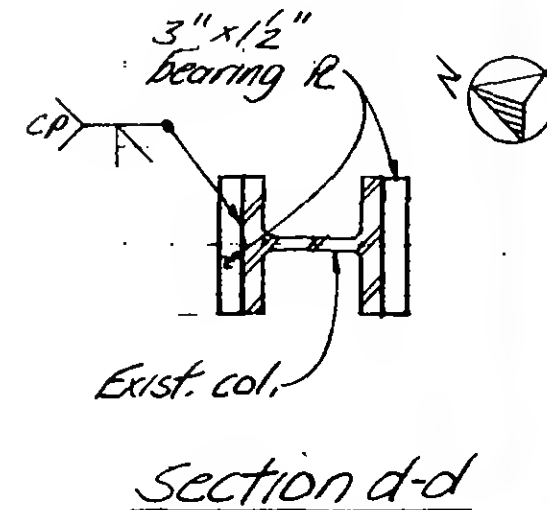
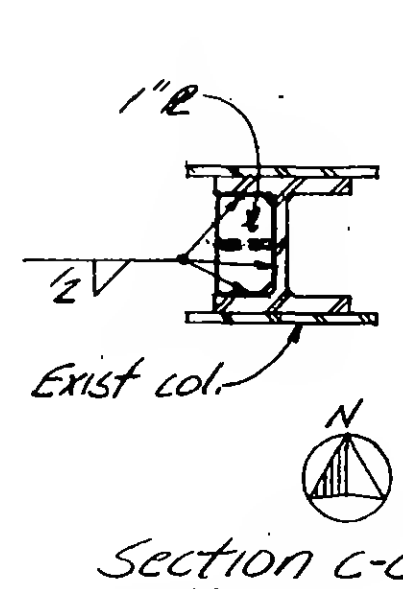
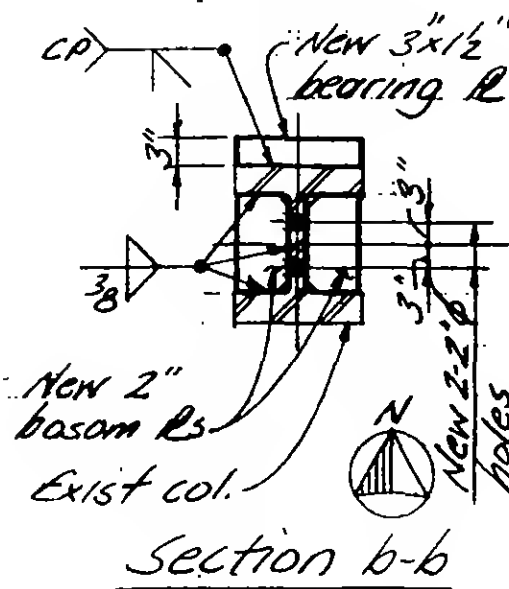
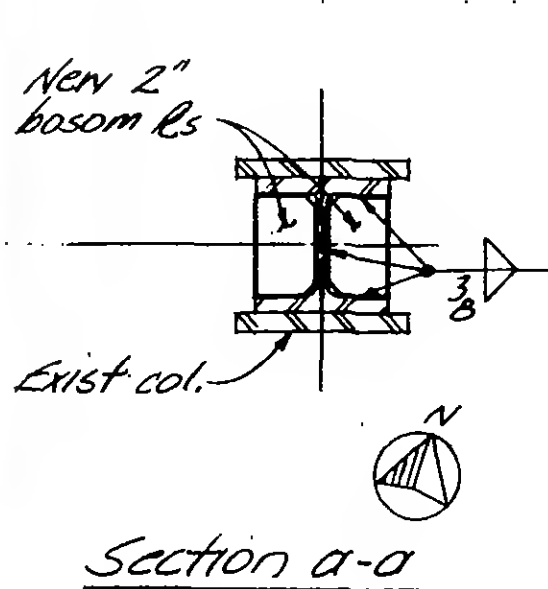
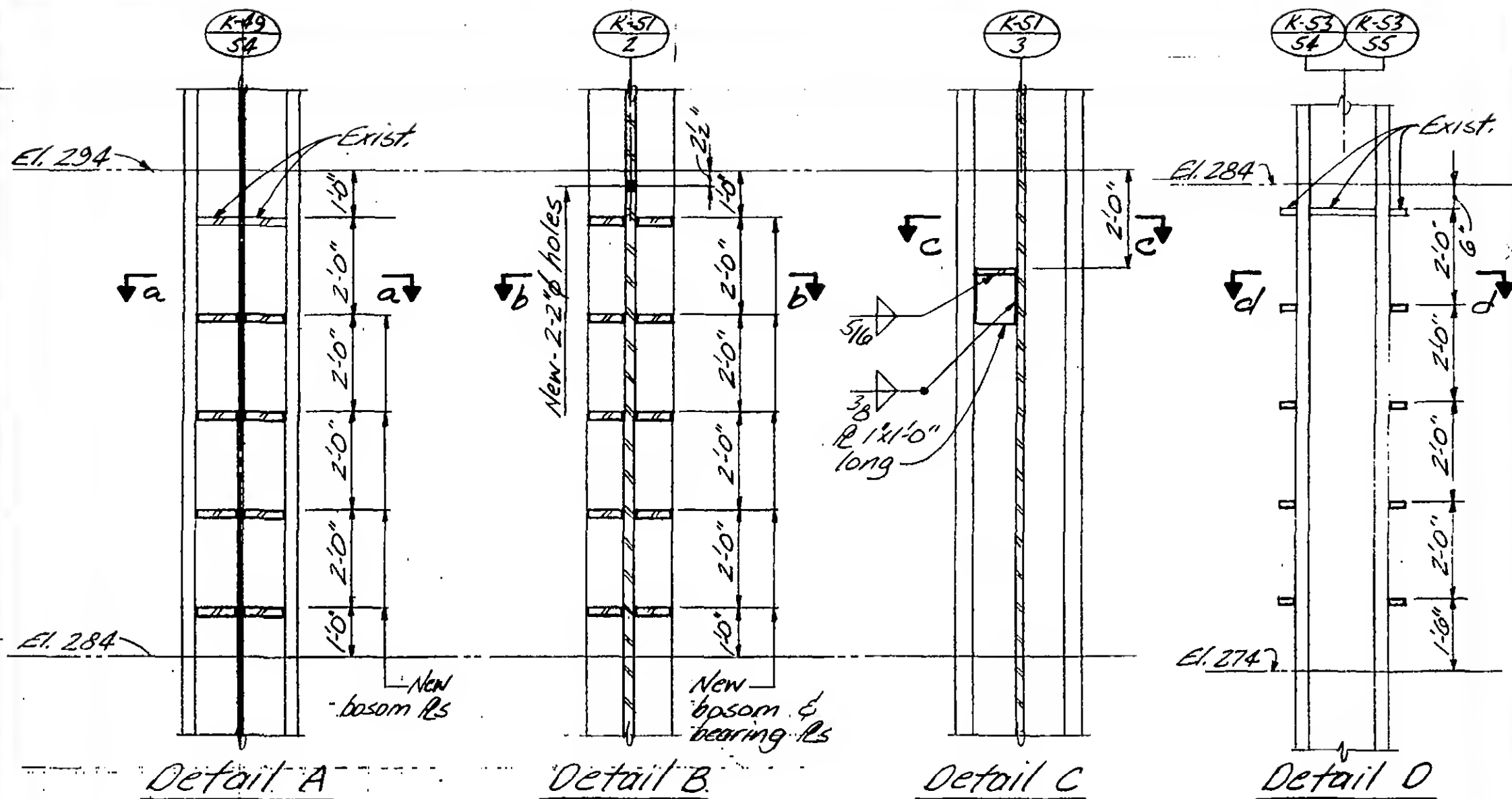
TITLE

NEW COLUMN BOSOM & BEARING PLATES

DATE

1-15-72

REVISIONS



DESIGNED

DRAWN

J. Adams

REVIEWED

W. Brewer

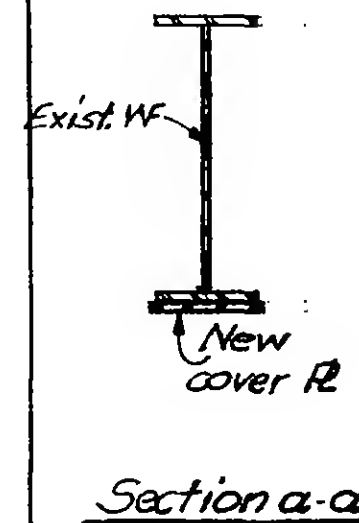
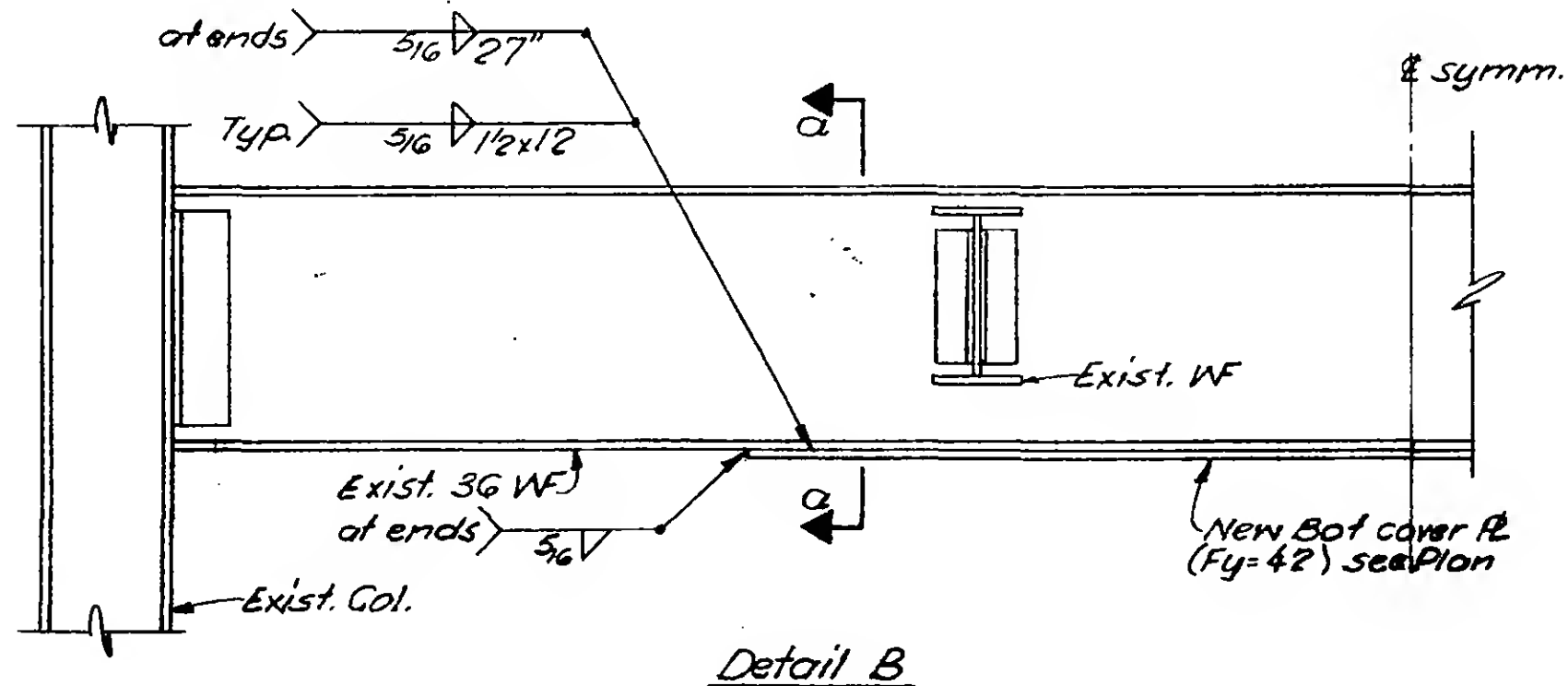
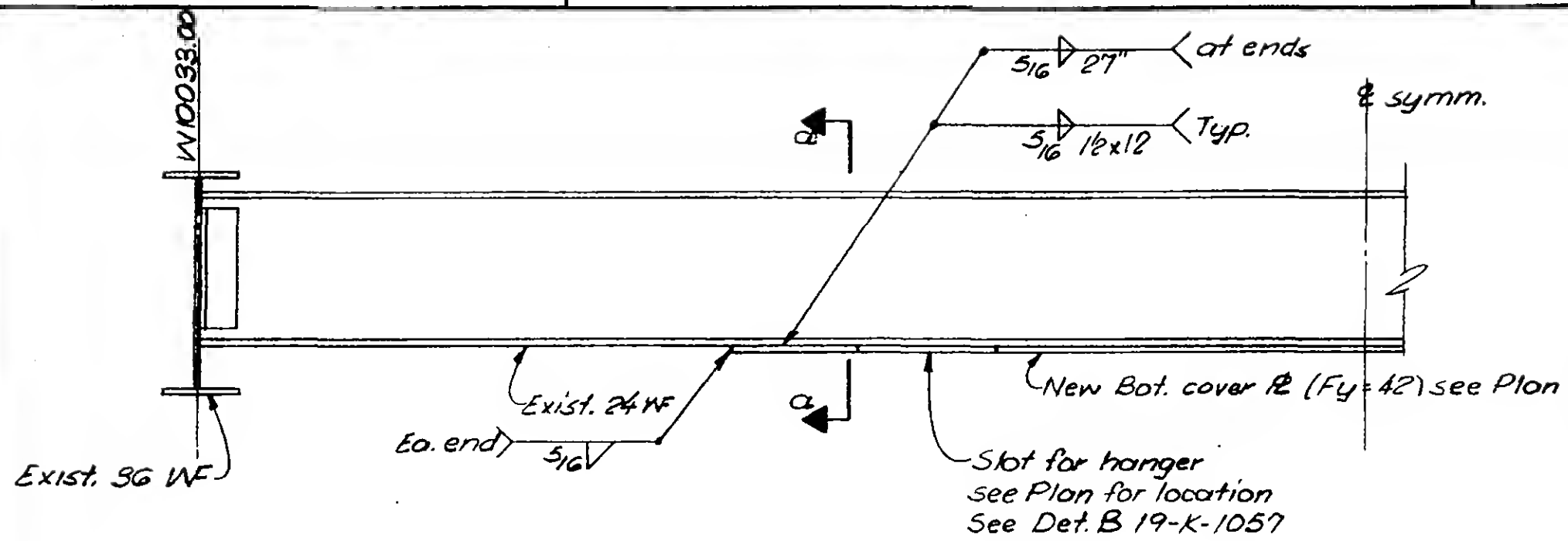
19-K-1059

PROJECT THE WORLD TRADE CENTER

TITLE BEAM COVER R-EI. 332-O

DATE 1-15-72

REVISIONS



DESIGNED

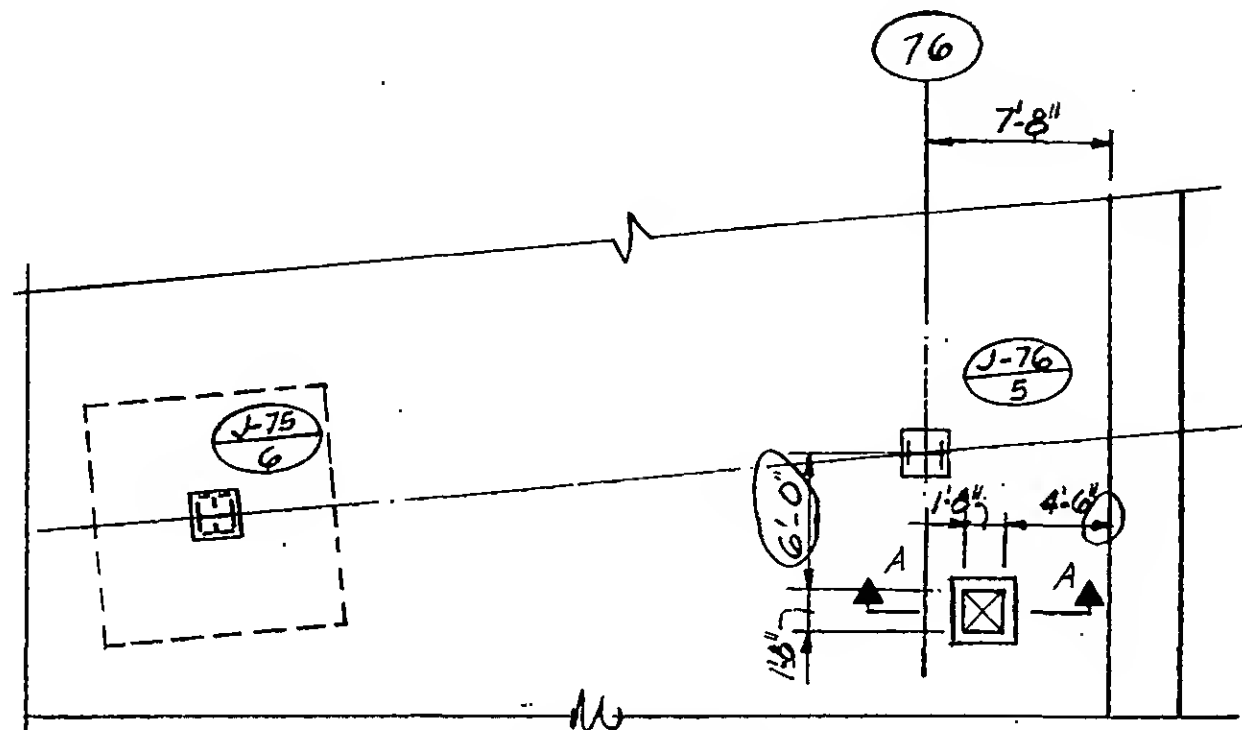
DRAWN

D. Brewer

19-K-1060

REVISIONS

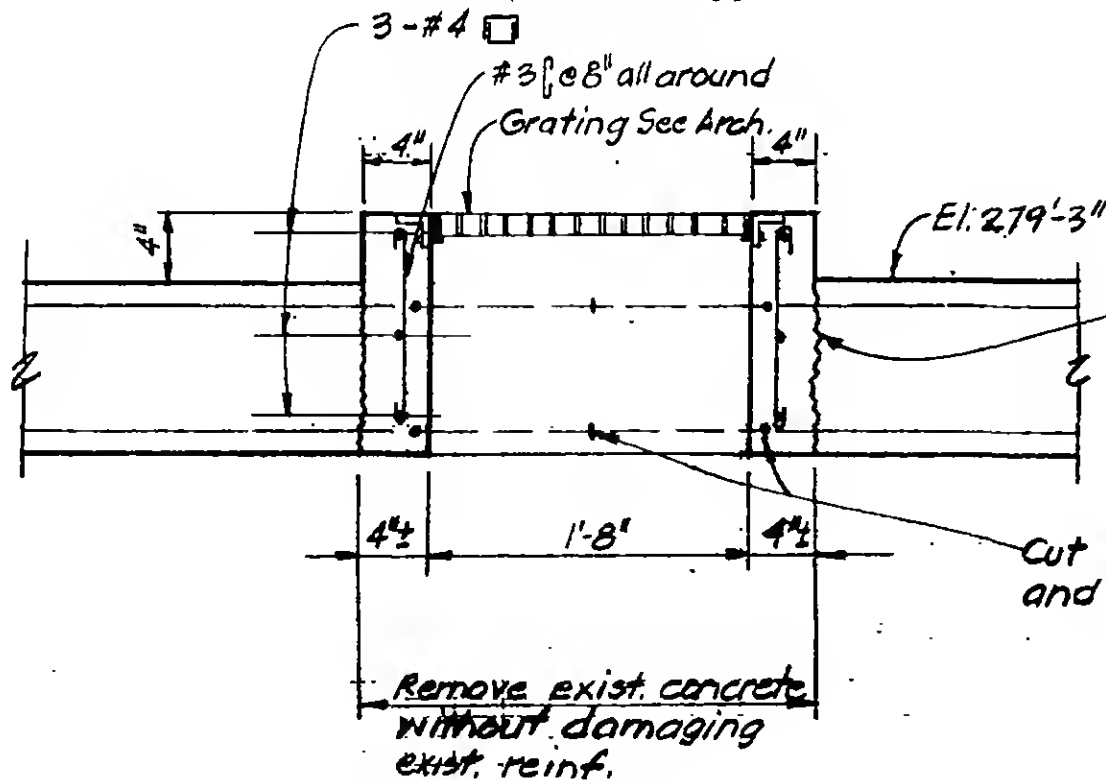
3-3-72



New opening per
PNYA change No.
299.190 drawing
SK-320 date 12/17/71

Part: Plan

El. 279-3" - SCJ-63



- Coat entire surface of exist concrete with approved epoxy bonding compound before placing new concrete.

Cut exist. reinf. on ϕ of opening
and bend horiz. into new concrete.

Remove exist. concrete
without damaging
exist. reinf.

Section A-A



DECLASSIFIED

DRAWN
P. Oceli'

REVIEWED

19-J-1061

PROJECT

THE WORLD TRADE CENTER

TITLE

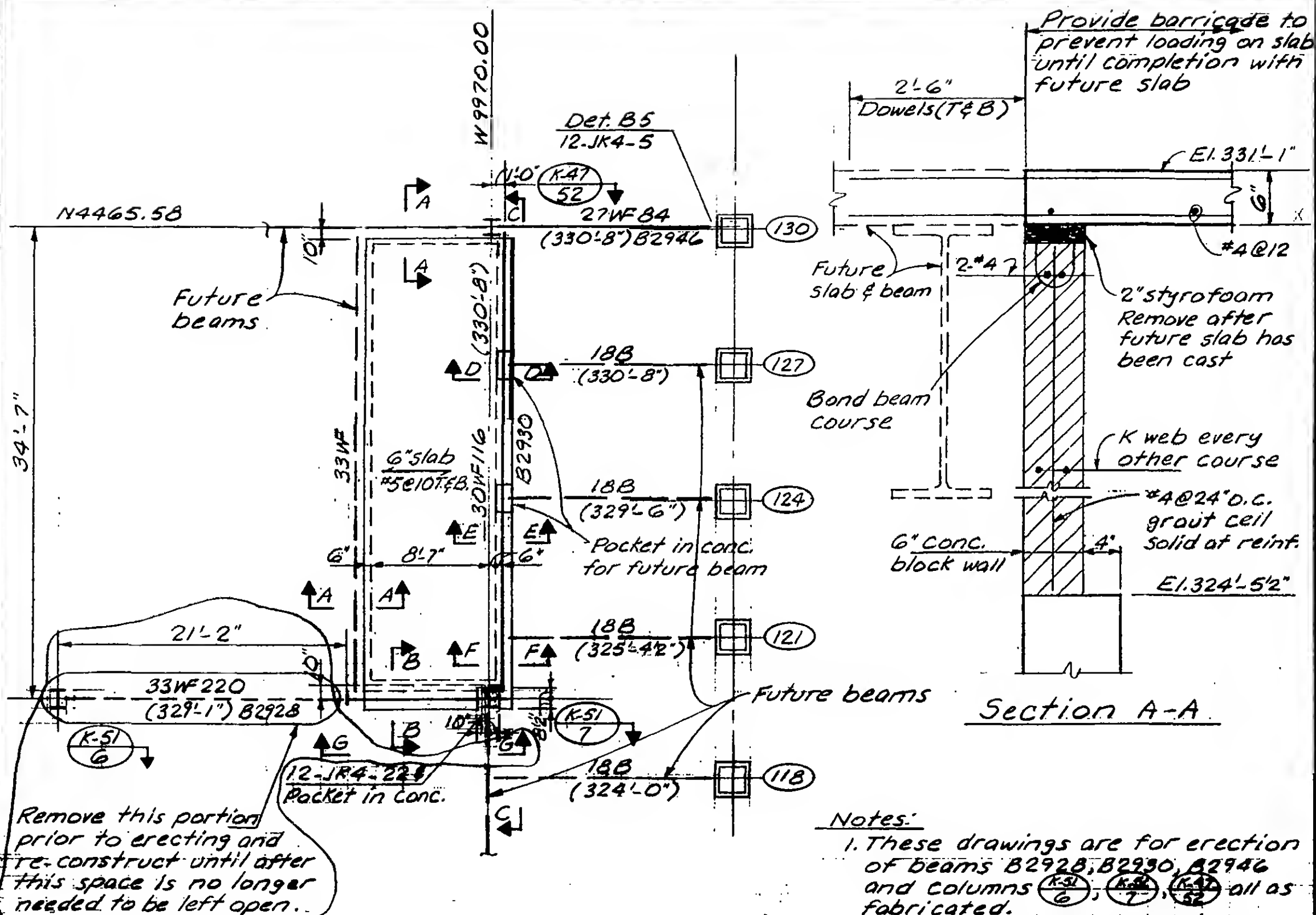
EL.332-ZONE K3-ELEVATORS K3, K4 & K5

DATE

2-11-72

REVISIONS

3-10-72



Remove this portion prior to erecting and re-construct until after this space is no longer needed to be left open.

Part Plan - El. 332'



DESIGNED
K. Chiang

DRAWN
A. FRANQUI

REVIEWED

19-K-1062.1

PROJECT

THE WORLD TRADE CENTER

TITLE

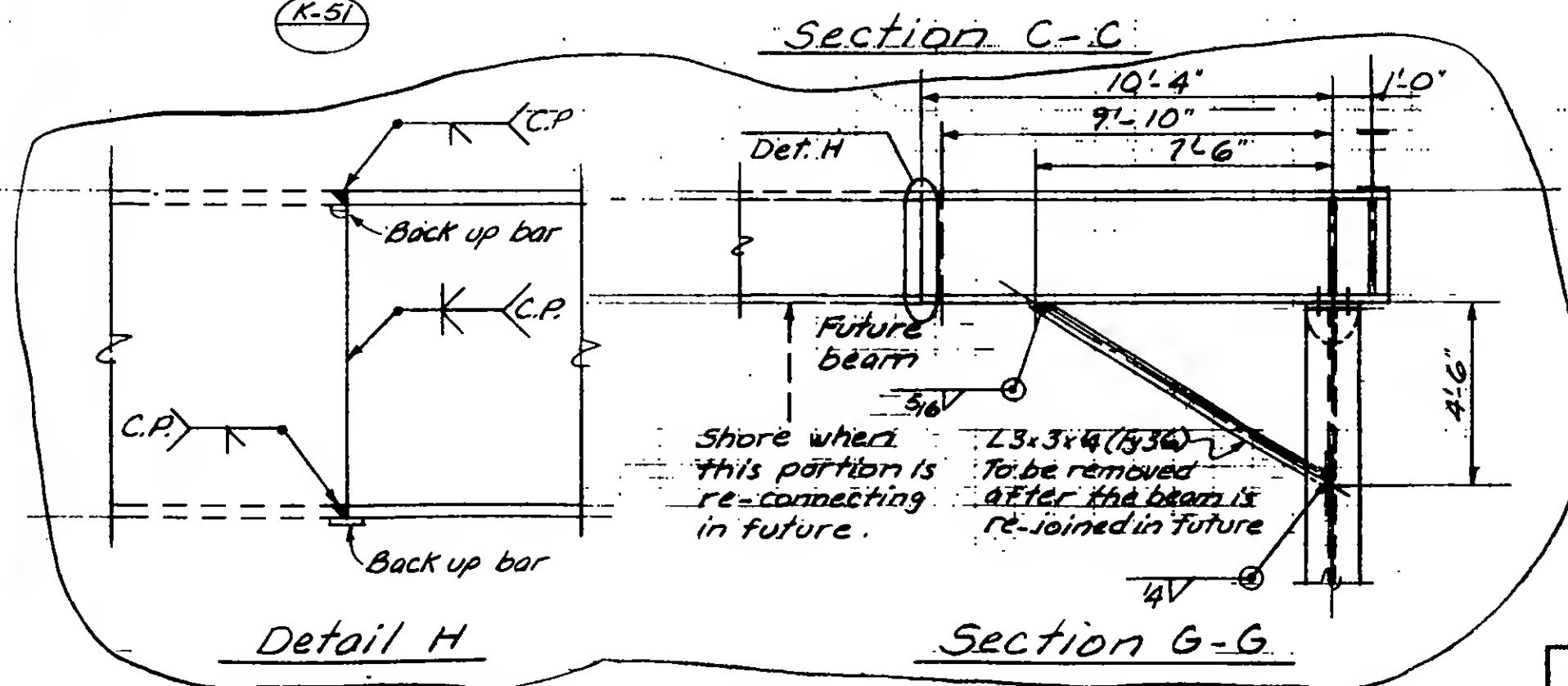
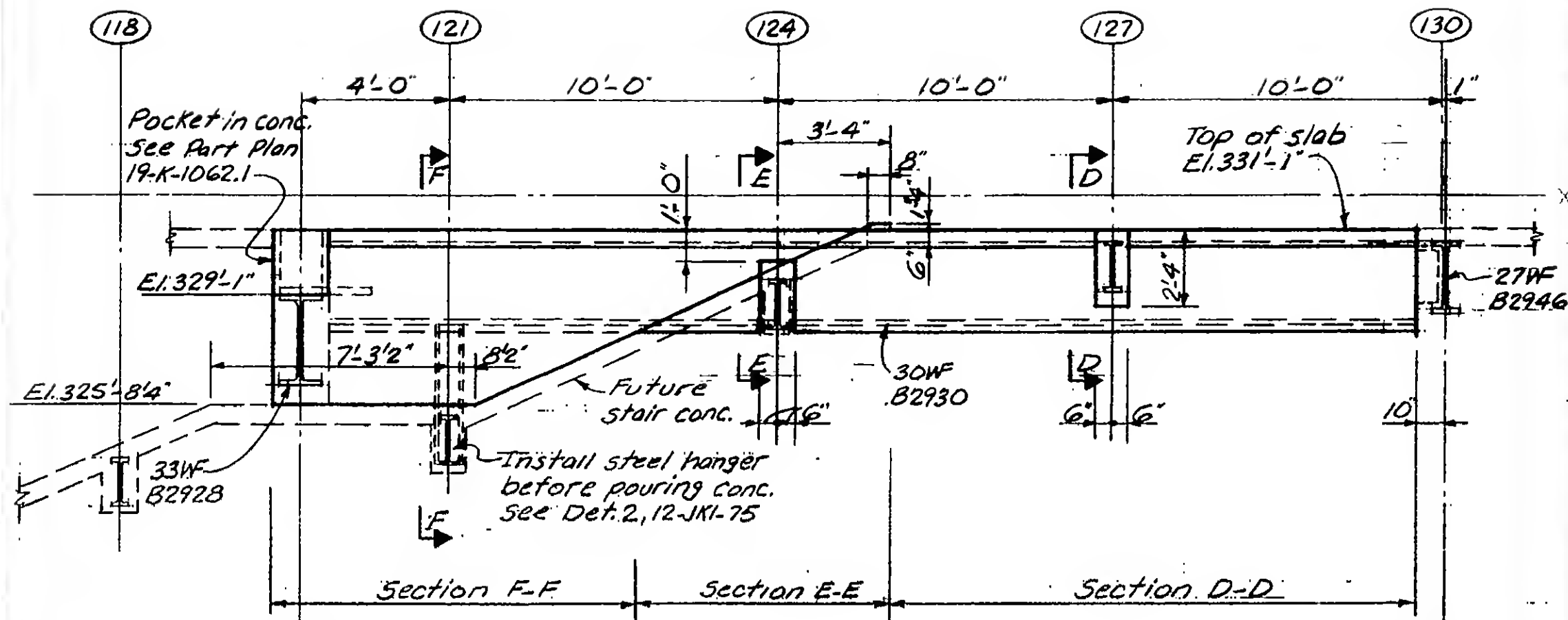
EL. 332-ZONE K3-ELEVATORS K3, K4 & K5

DATE

2-11-72

REVISIONS

3-10-72

DESIGNED
K. ChiangDRAWN
A. Franqui

REVIEWED

19-K-1062.2

PROJECT

THE WORLD TRADE CENTER

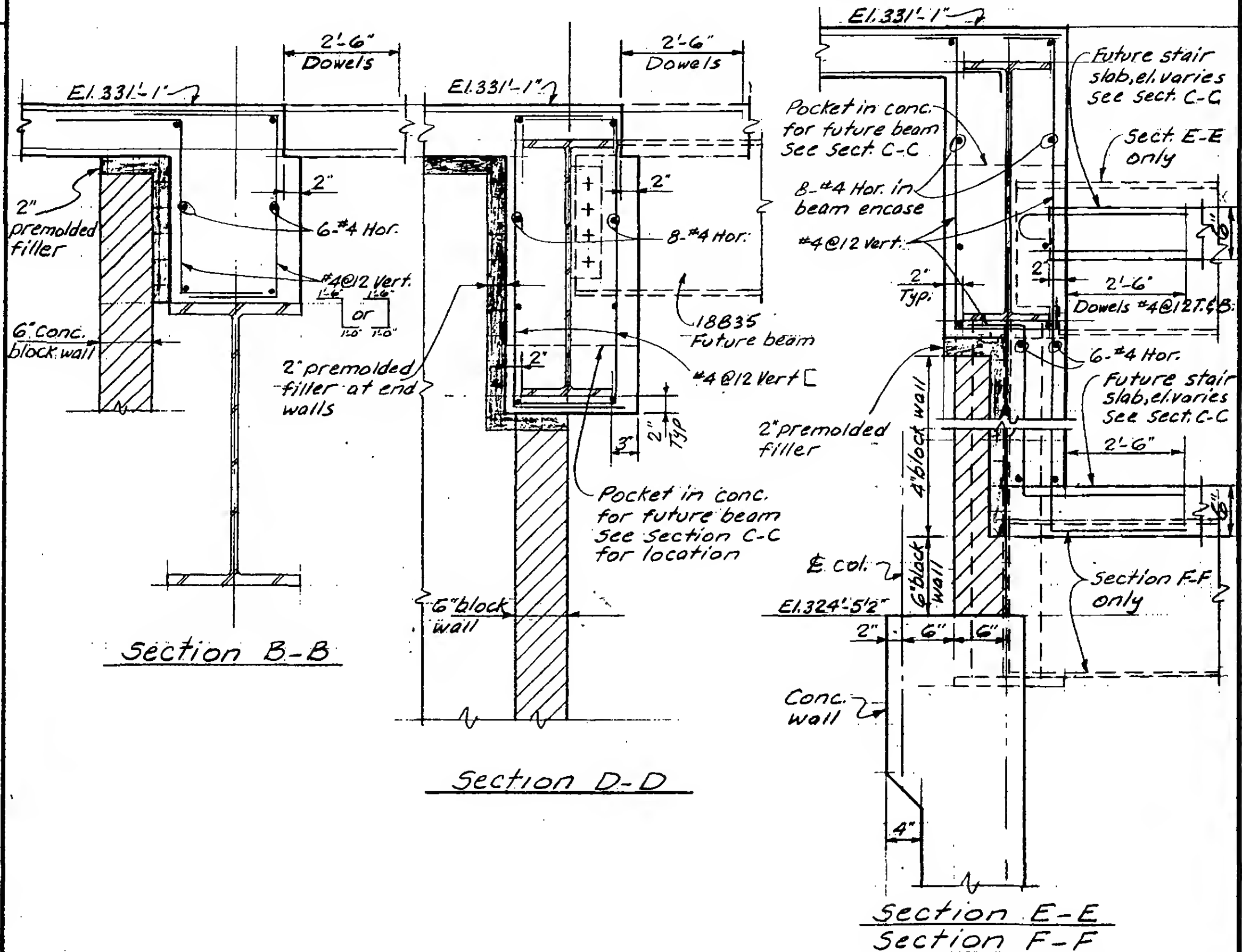
TITLE

EL. 332 - ZONE K3 - ELEVATORS K3, K4 & K5

DATE

2-11-72

REVISIONS

DESIGNED
K. ChiangDRAWN
A. Franqui

REVIEWED

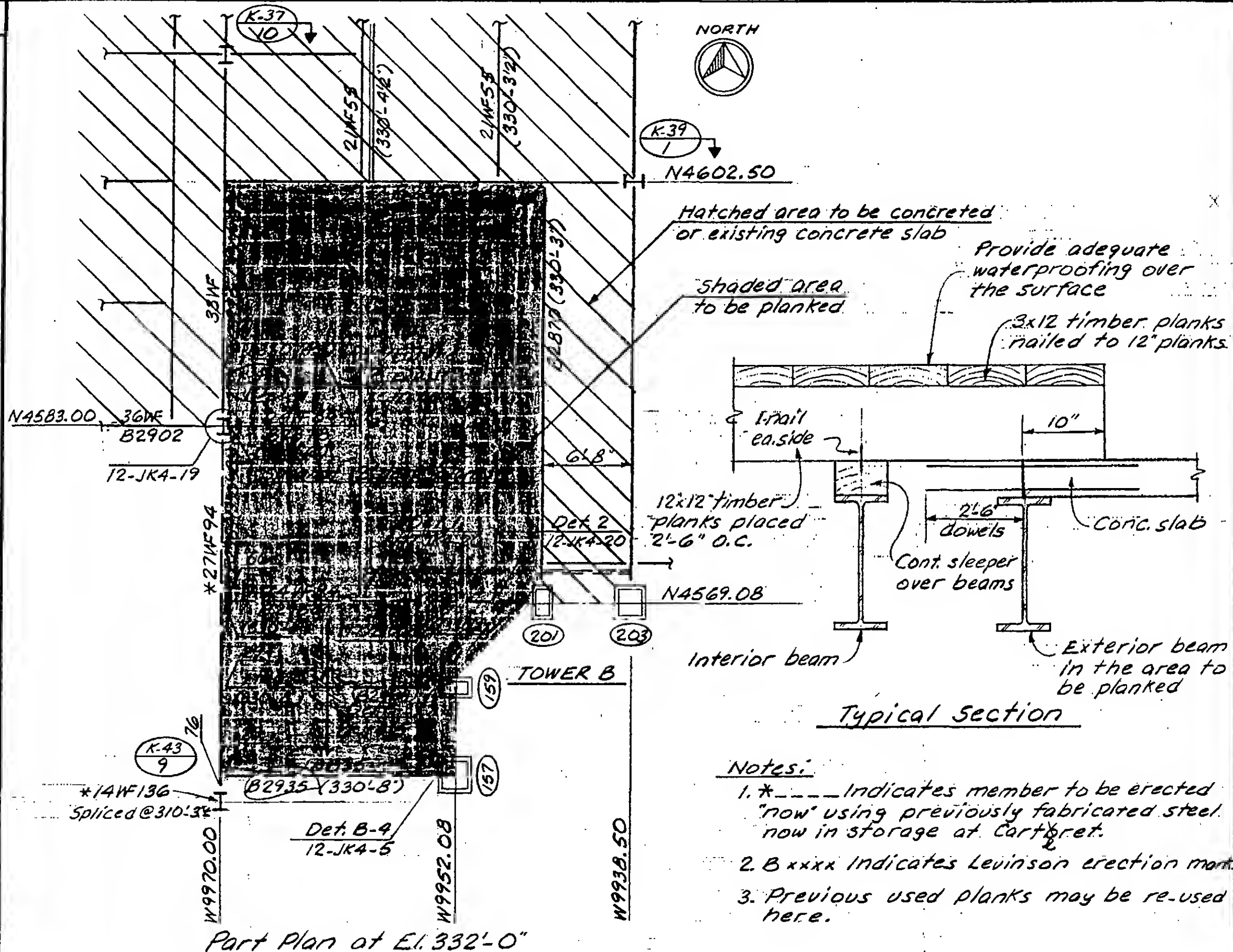
19-K-1062.3

PROJECT THE WORLD TRADE CENTER

TITLE TEMPORARY PLANKED AREA-EL.332'-ZONE K-1

DATE 2-16-72

REVISIONS



DESIGNED K. Chiang

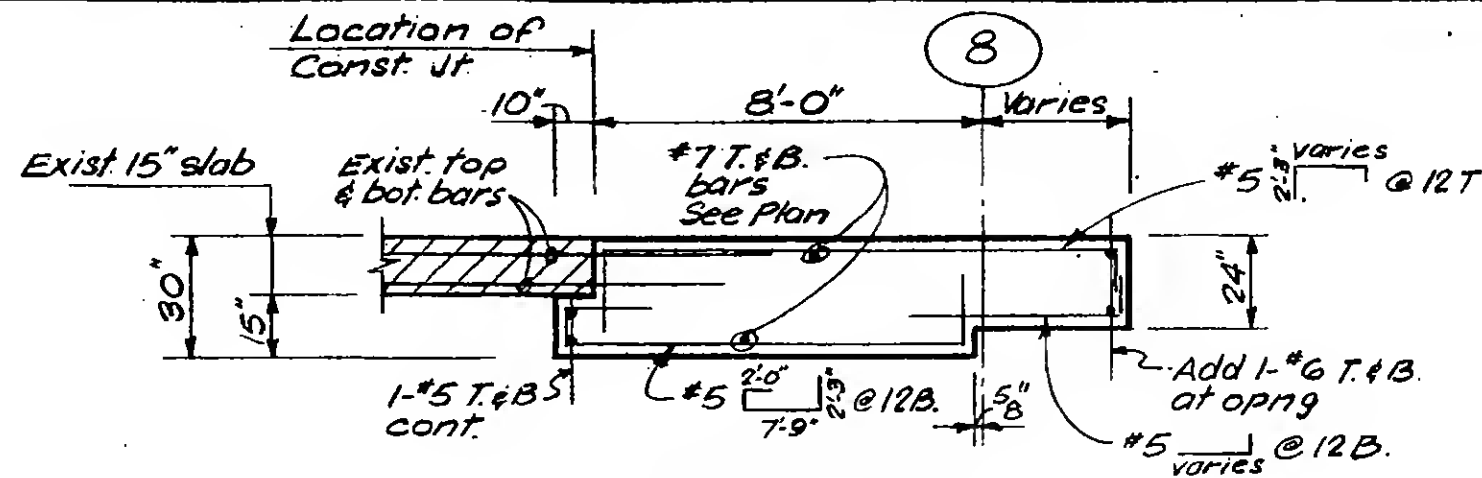
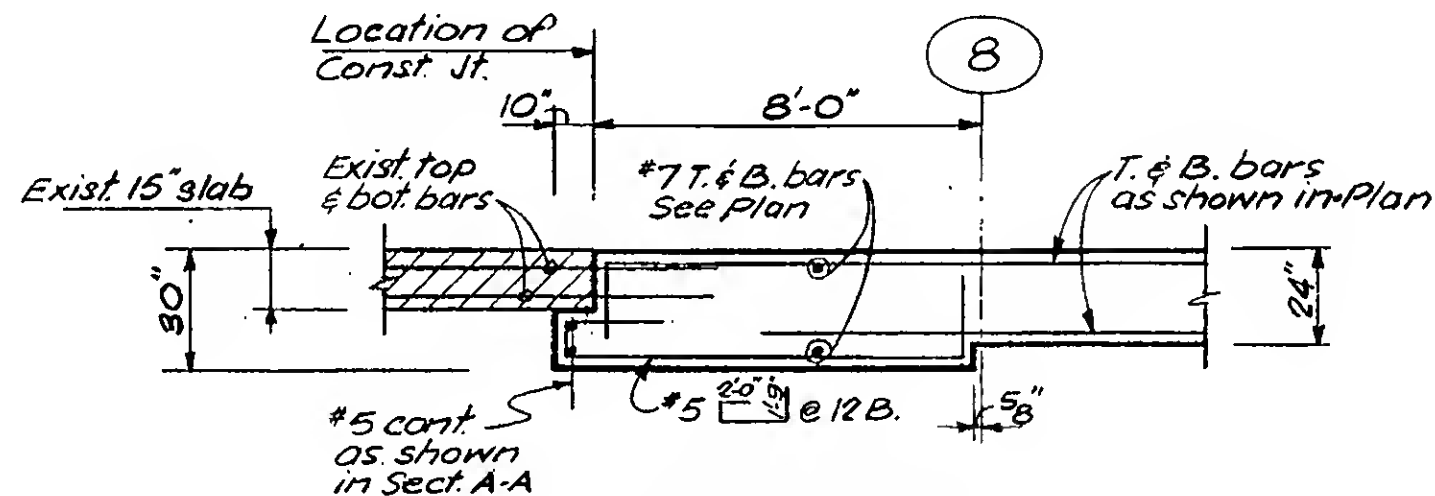
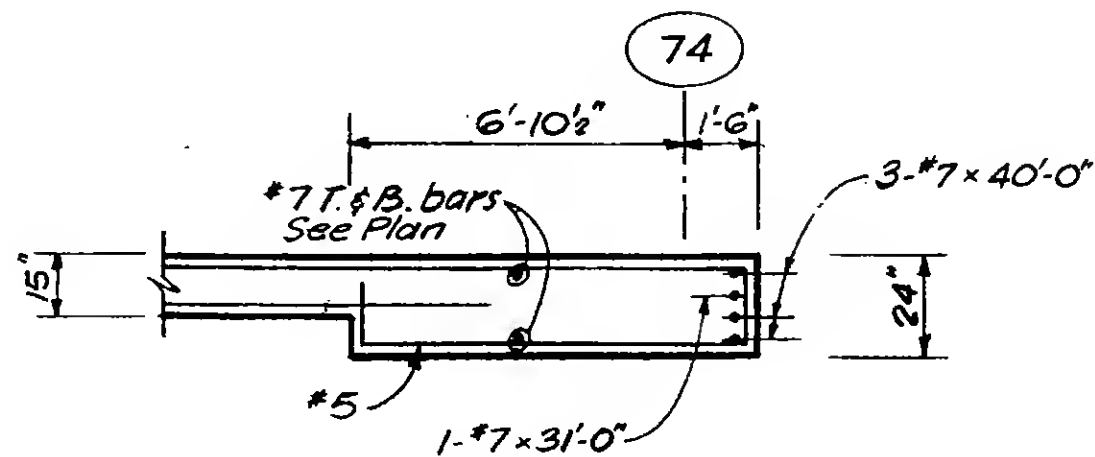
DRAWN A. Franqui

REVIEWED

19-K-1063

PROJECT **THE WORLD TRADE CENTER**TITLE **PATH - NEW STAIR**DATE **2-25-72**

REVISIONS

Section A-ASection B-BSection C-CDESIGNED
ETLDRAWN
SC

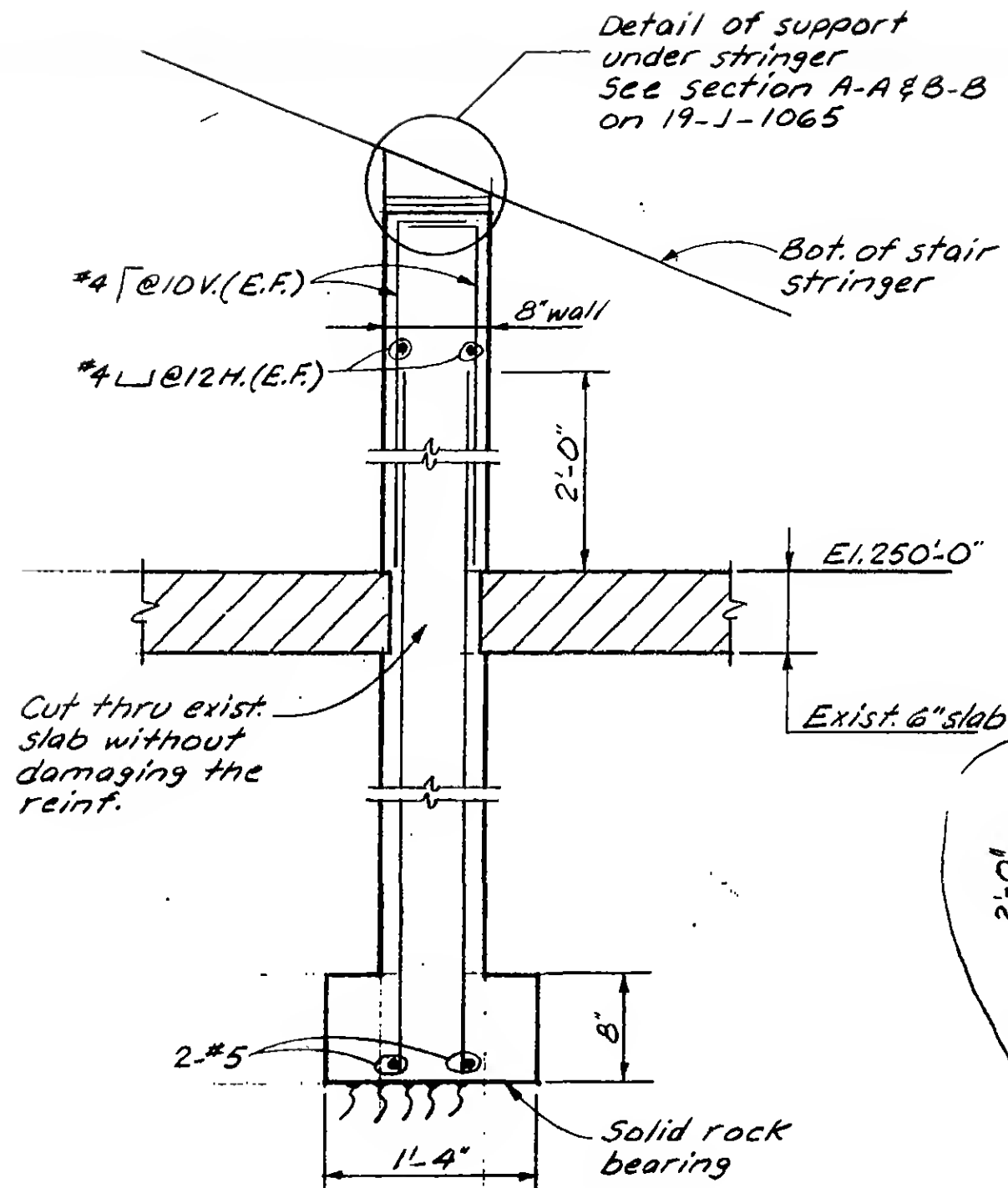
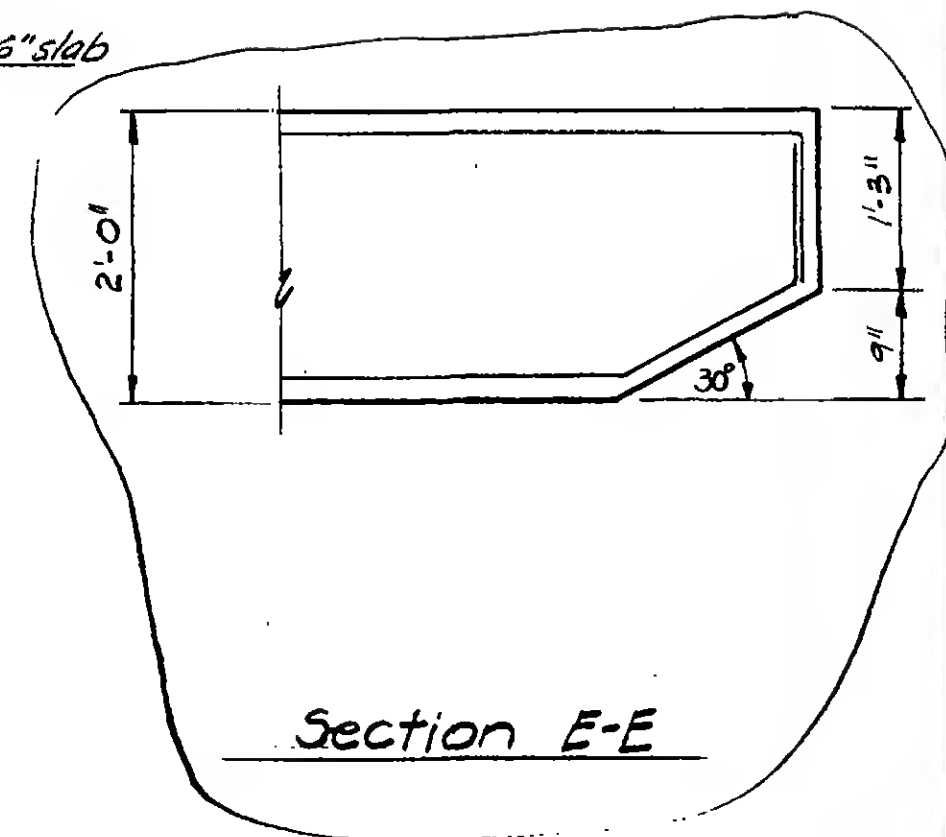
REVIEWED

19-J-1064.1

PROJECT **THE WORLD TRADE CENTER**TITLE **PATH-NEW STAIR**DATE **2-25-72**

REVISIONS

3-16-72

Section D-DSection E-EDESIGNED
ETLDRAWN
A.F.

REVIEWED

19-J-1064.2

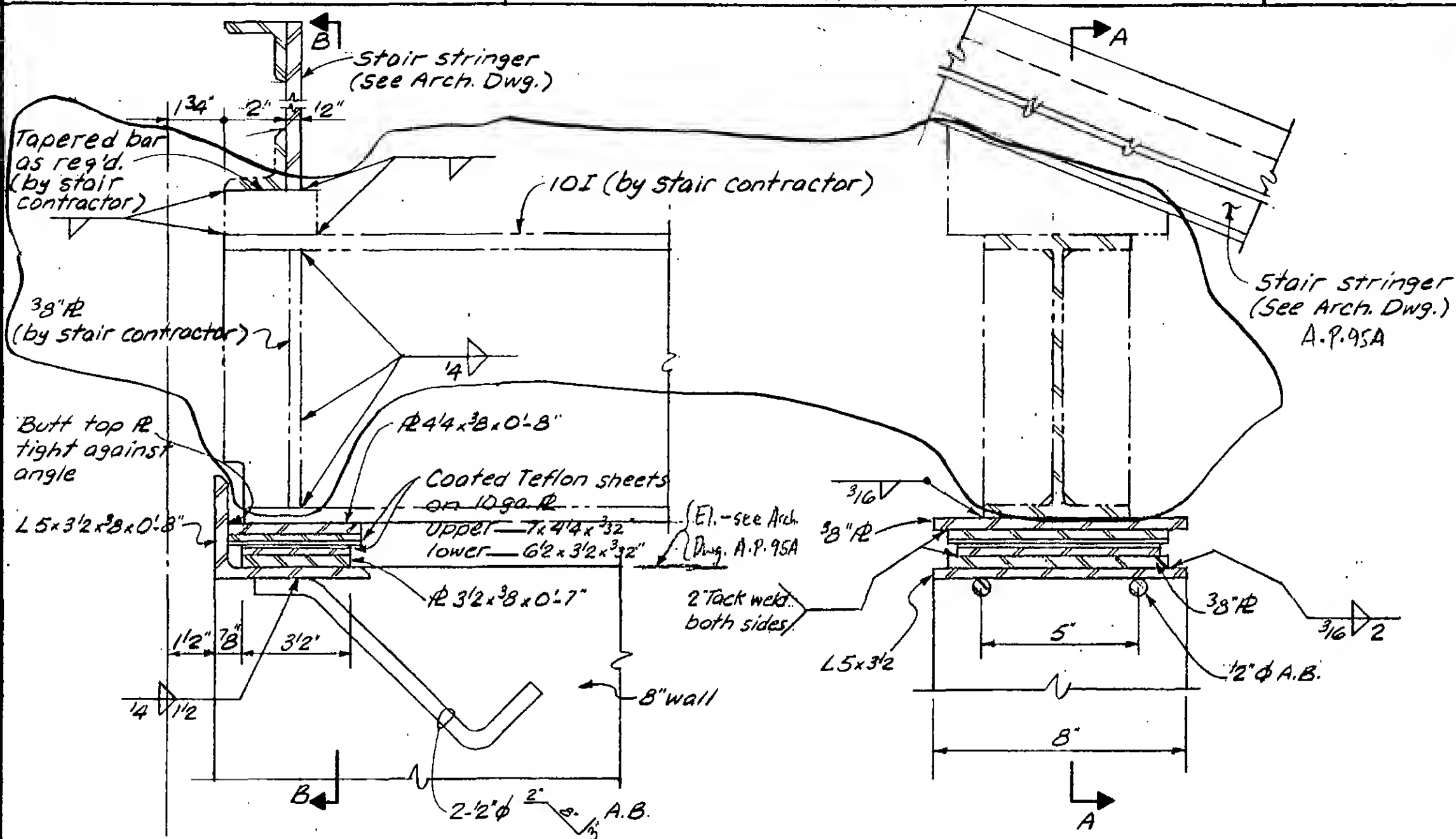
PROJECT THE WORLD TRADE CENTER

TITLE PATH-NEW STAIR P-14

DATE 2-25-72

REVISIONS

9-4-73



Section A-A

Section B-B

3" = 1'-0"

19-J-1065

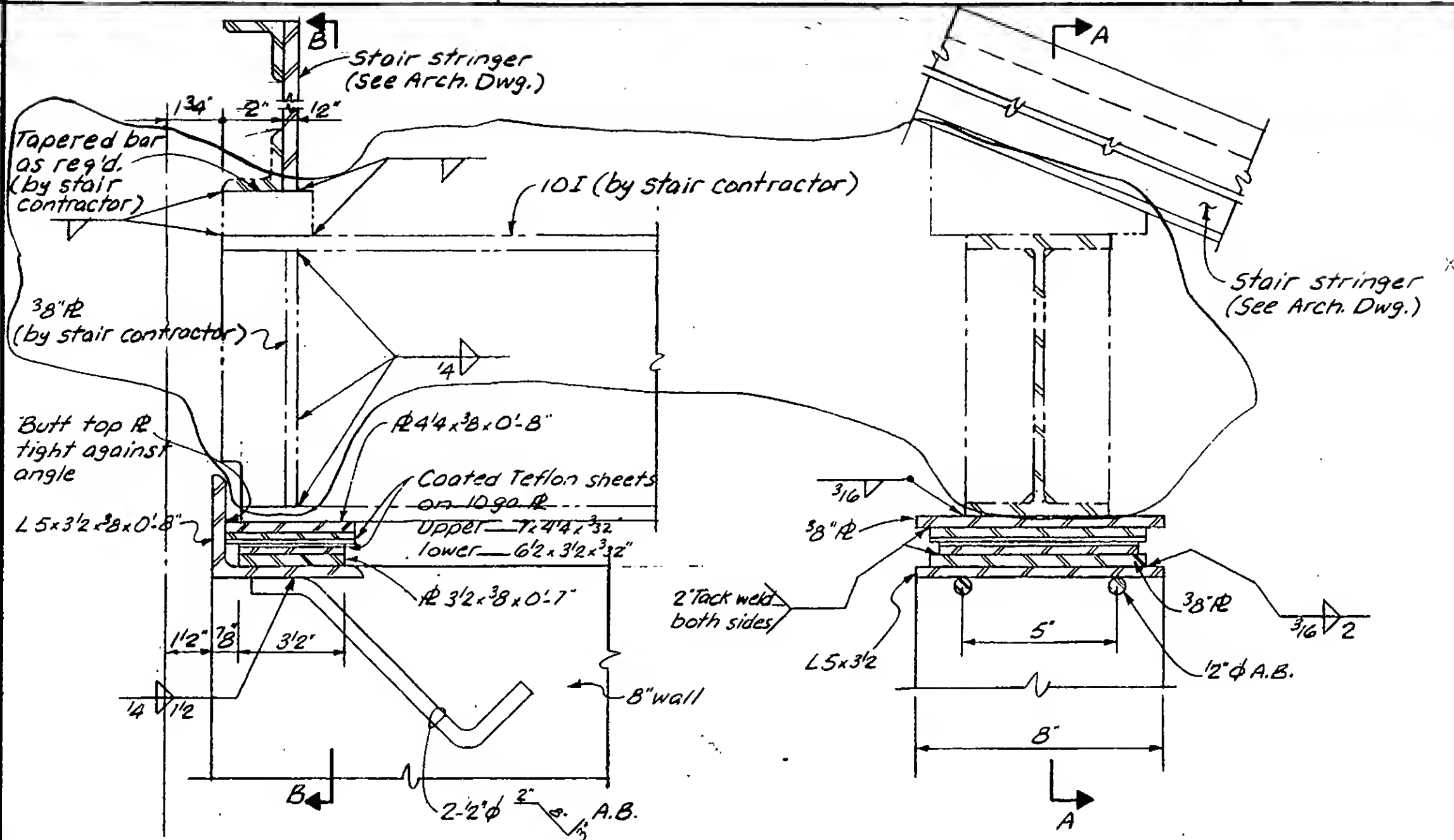
DESIGNED
E.T.L.DRAWN
A.F.

REVIEWED

PROJECT **THE WORLD TRADE CENTER**TITLE **PATH-NEW STAIR**DATE **2-25-72**

REVISIONS

9-4-73

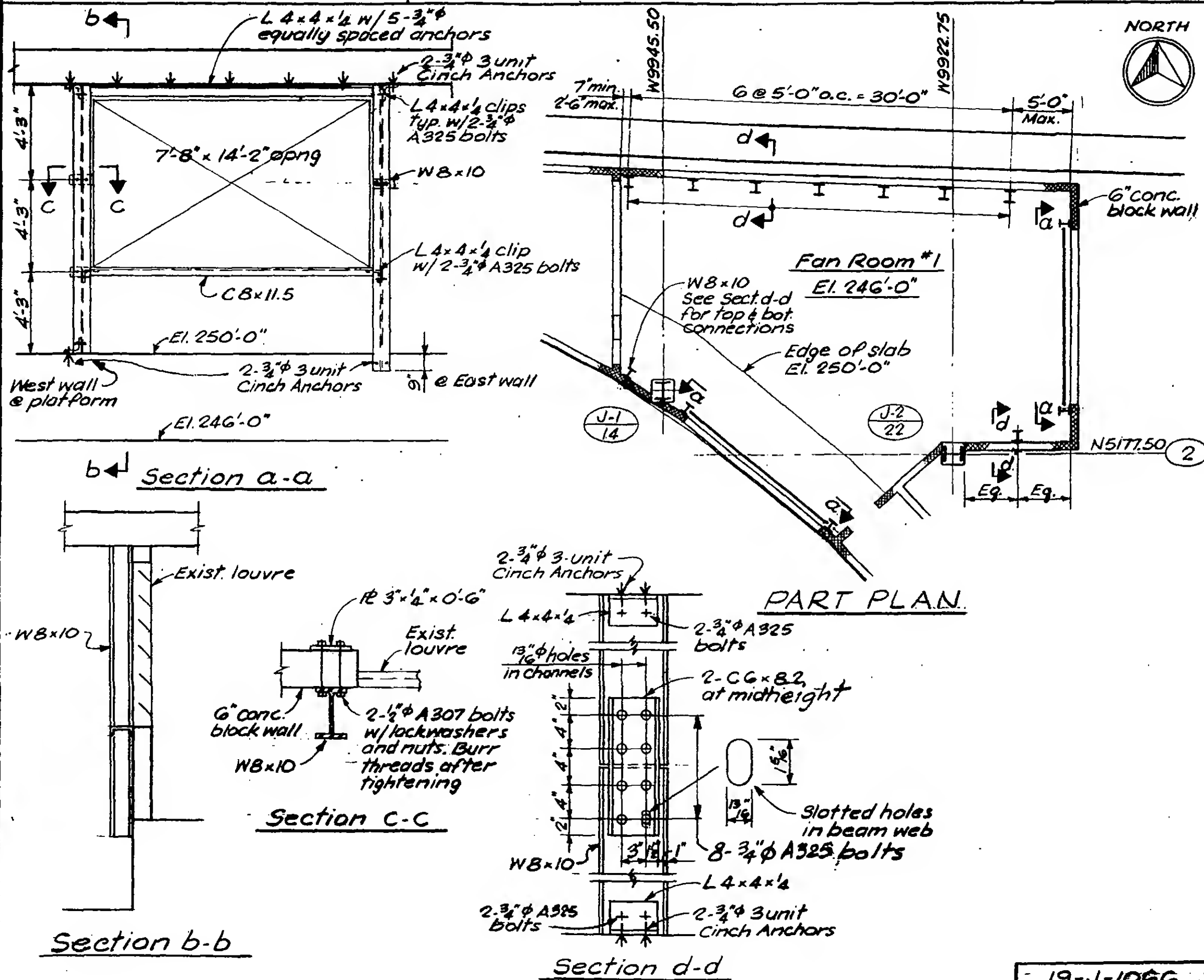
Section A-ASection B-BDESIGNED
E.T.L.DRAWN
A.F.

REVIEWED

3" = 1'-0"

19-J-1065

REVISIONS



DESIGNED
EJW

DRAWN
SC

REVIEWED
WAB

19-J-1066

SKILLING, HELLE, CHRISTIANSEN, ROBERTSON

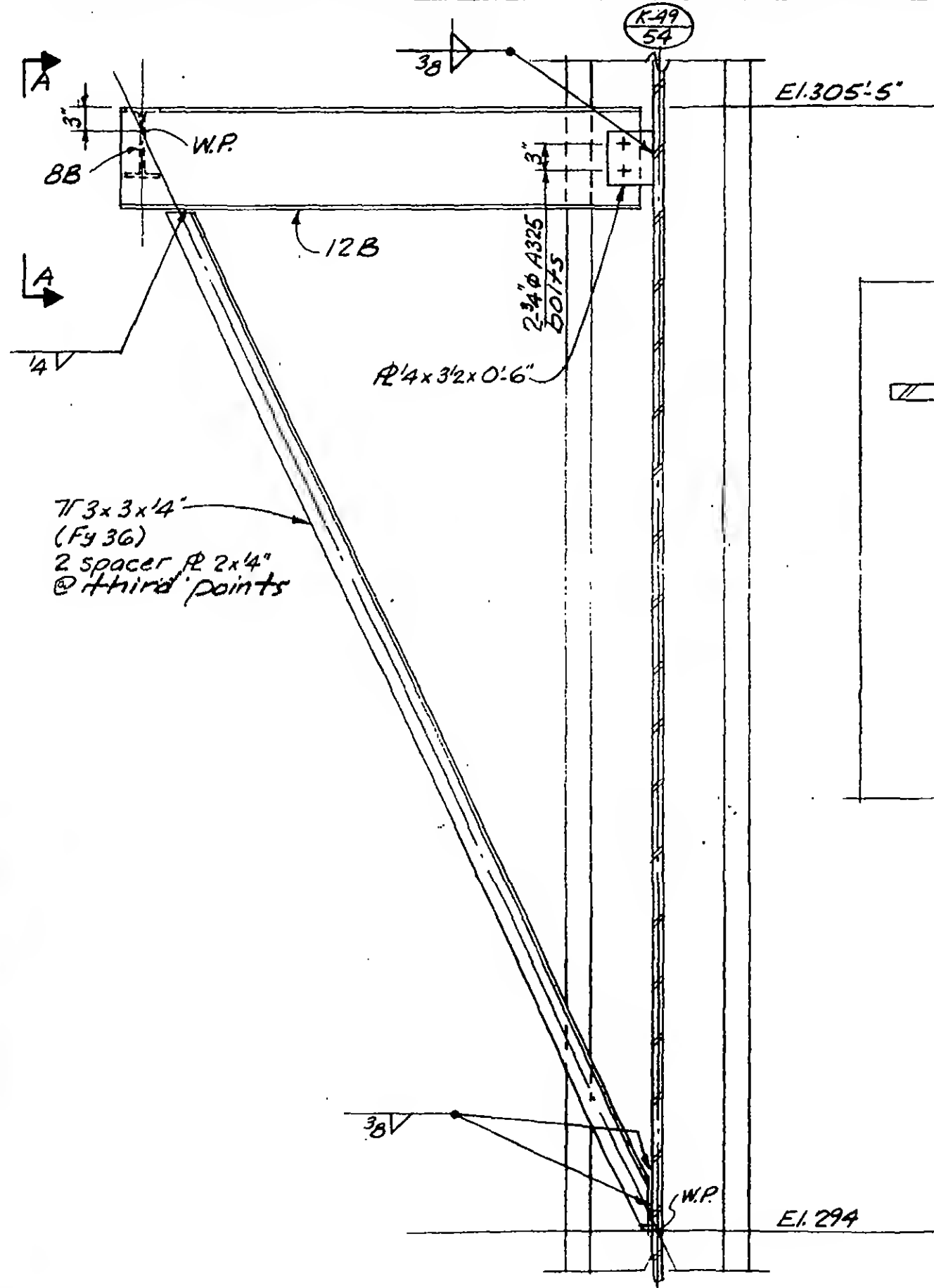
Structural & Civil Engineers

PROJECT THE WORLD TRADE CENTER

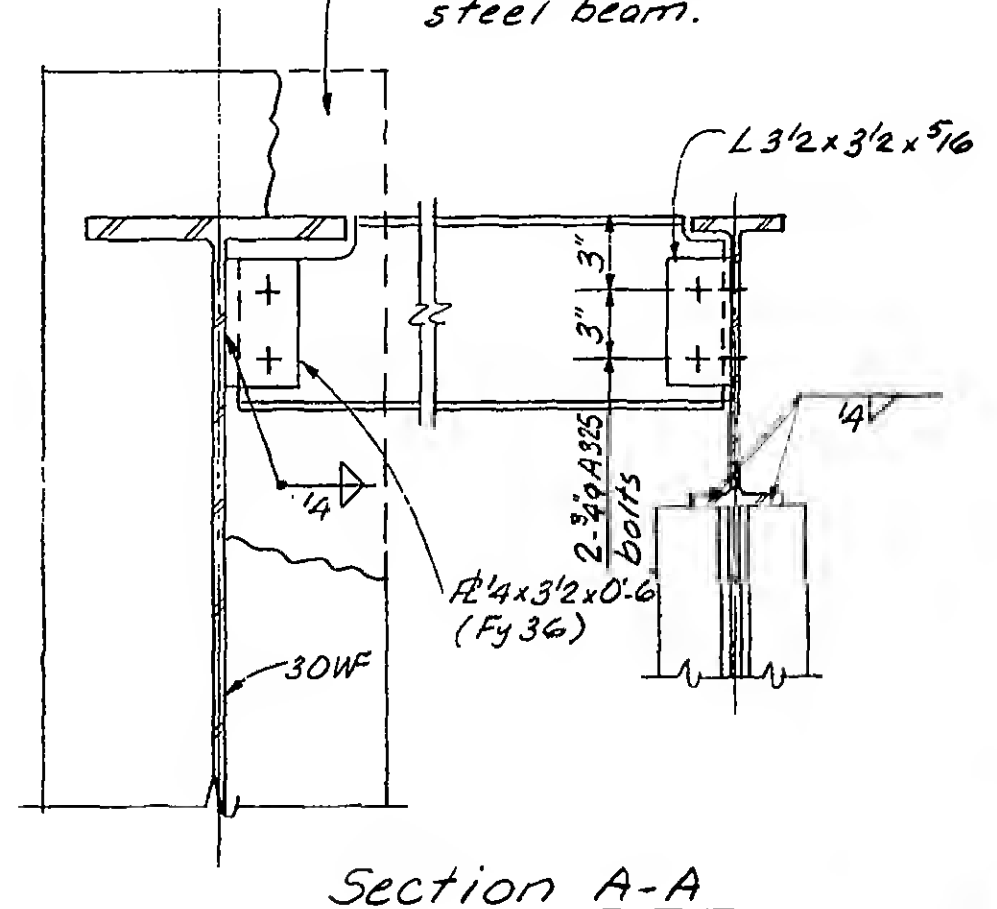
TITLE PARKING ELEVATOR - ZONE K3-EL.310

DATE 3-10-72

REVISIONS



Note that part of conc. encasement to be removed, without damage of rebars, prior to install new steel beam.

DESIGNED
K. ChiangDRAWN
A. FranquiREVIEWED
M.B.

19-K-1067

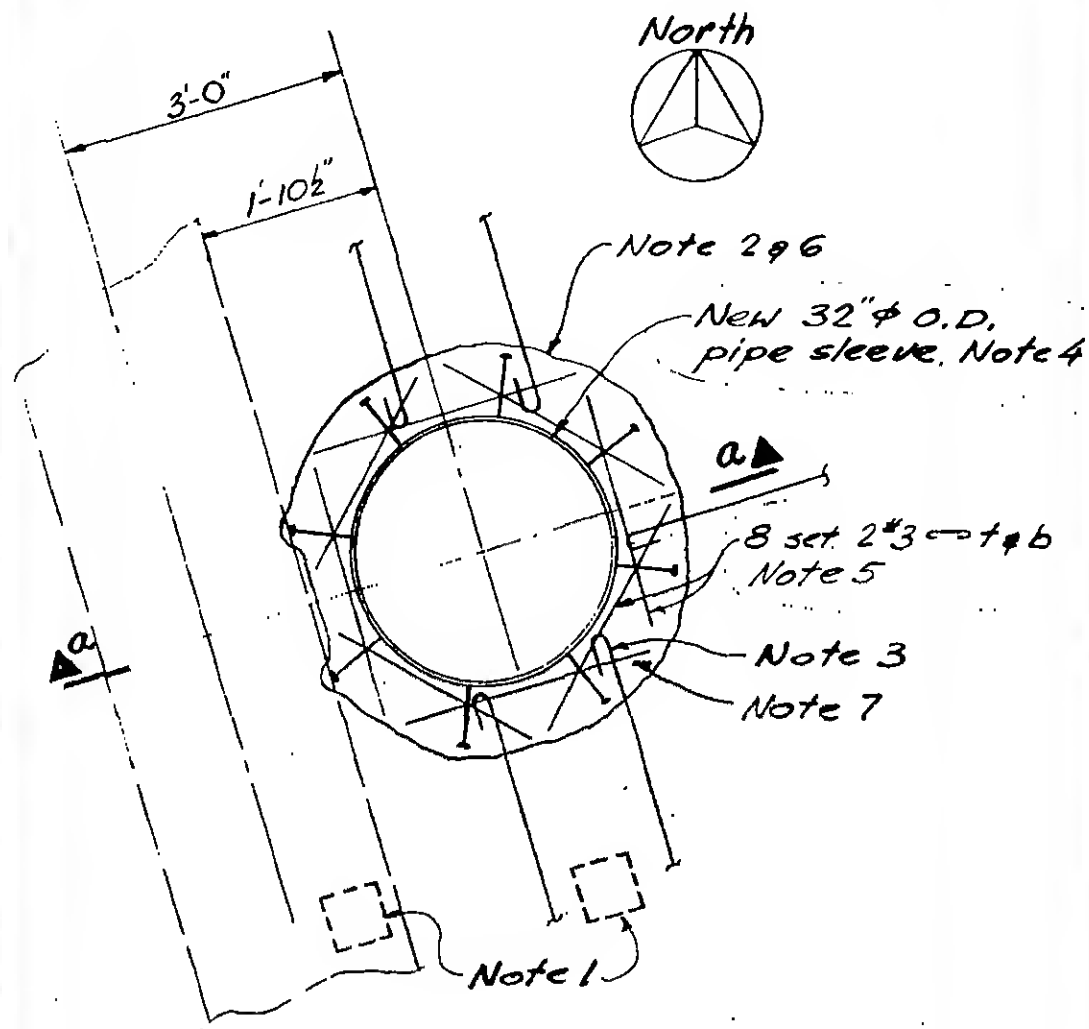
PROJECT THE WORLD TRADE CENTER

TITLE NEW SLAB OPENINGS ZONE KI-EL.274

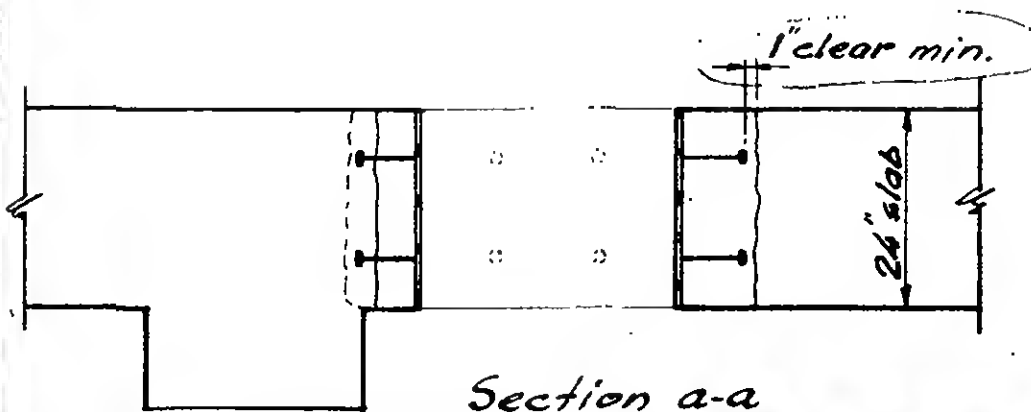
DATE 5-4-72

REVISIONS

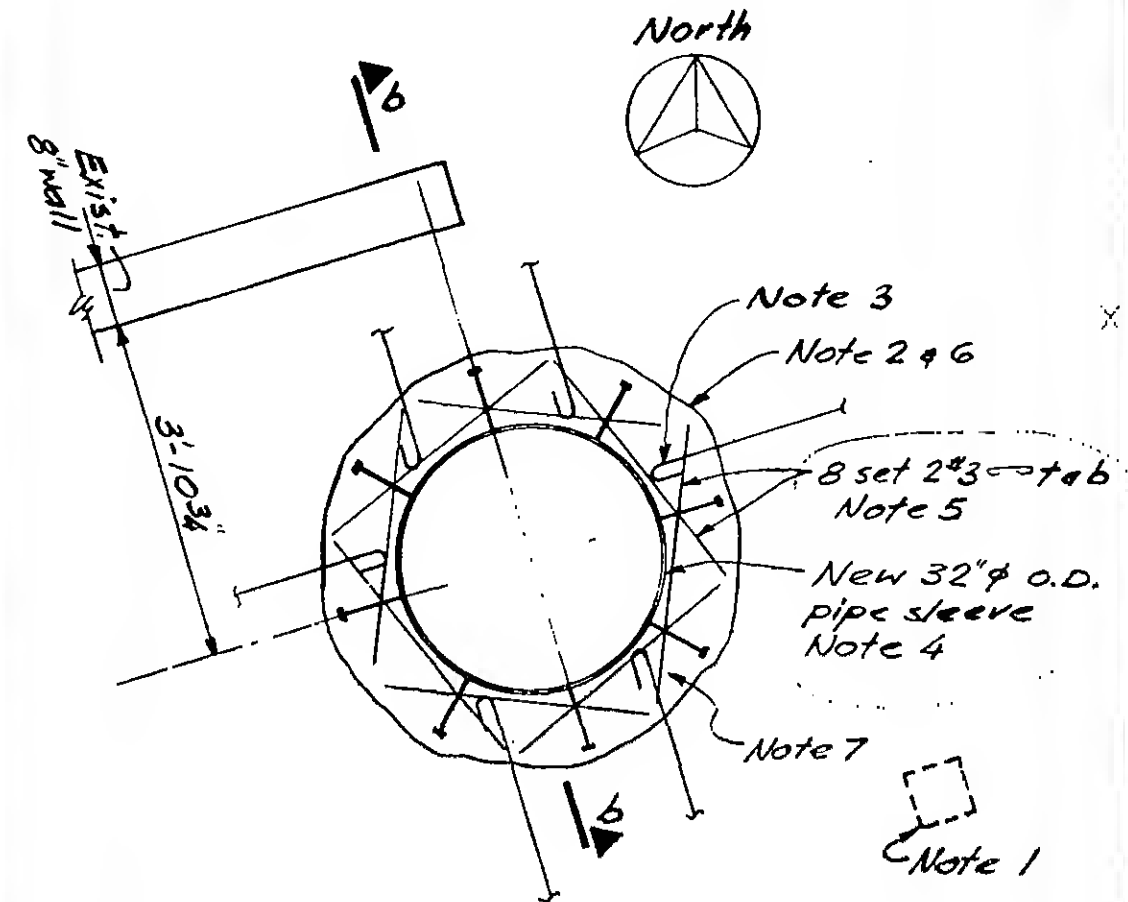
6-23-72



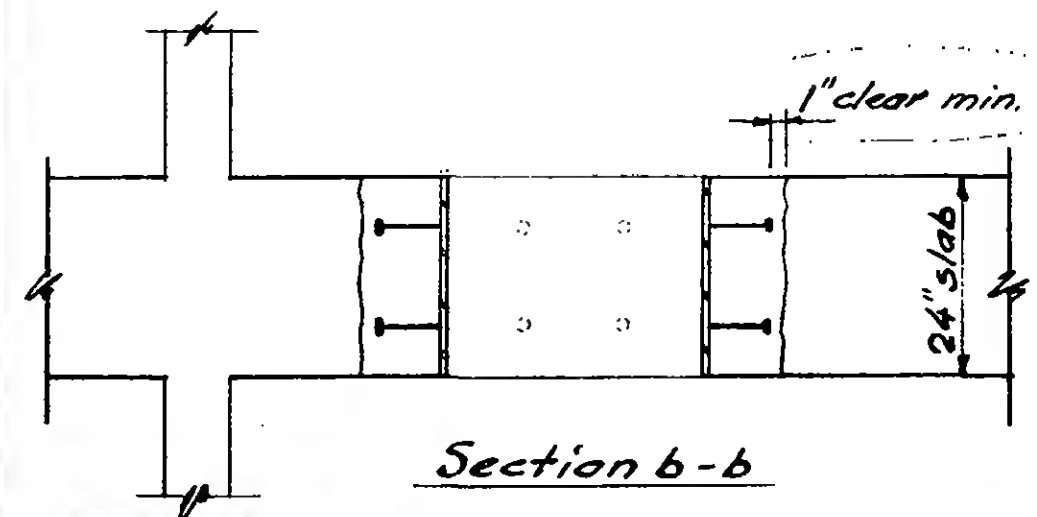
Part Plan



Detail "A"



Part Plan



Detail "B"



DESIGNED

DRAWN
J. Gricius

REVIEWED

See 19-K-1068.2 for notes

19-K-1068.1

PROJECT

THE WORLD TRADE CENTER

TITLE

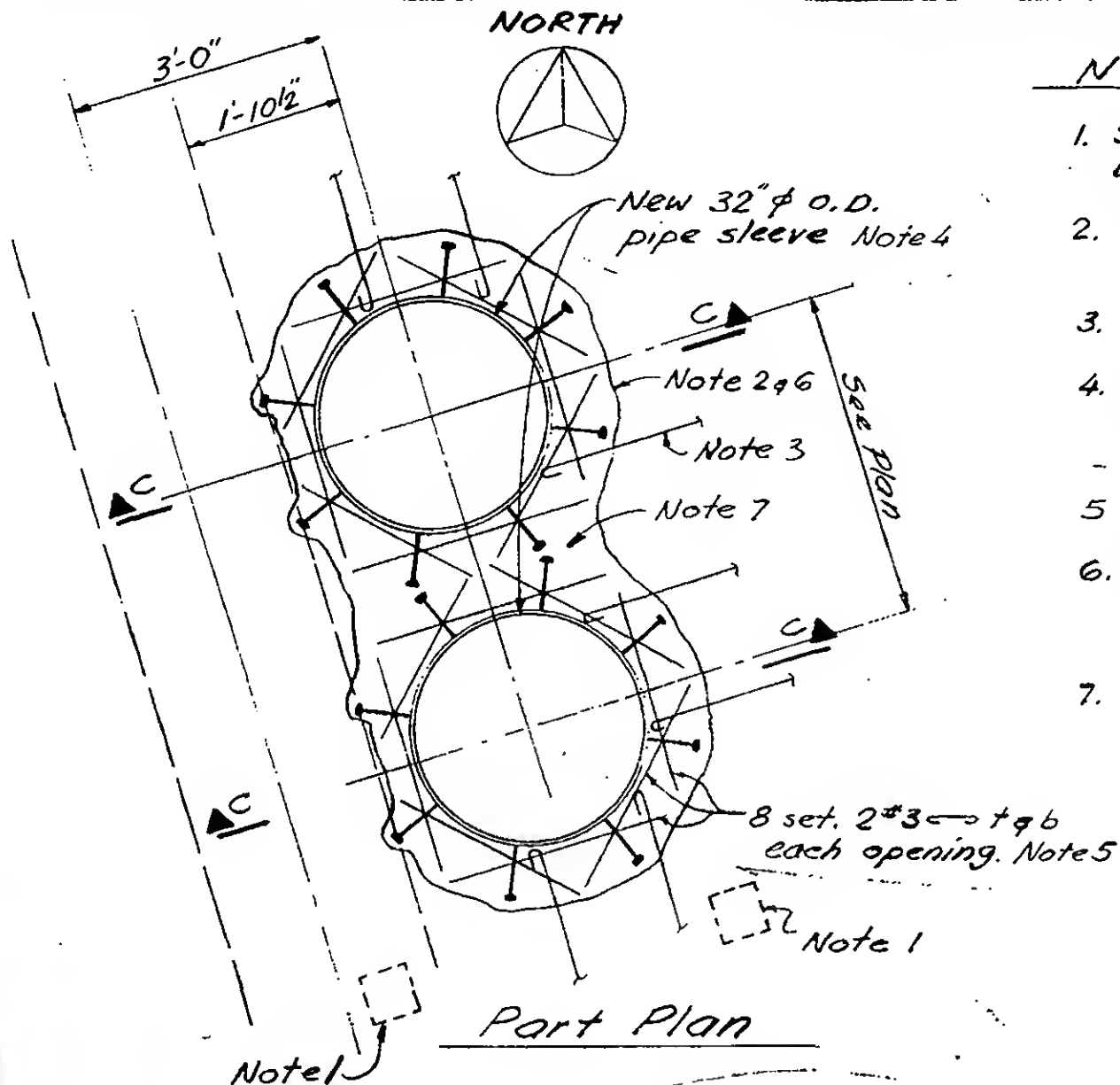
NEW SLAB OPENINGS ZONE K1-EL284-294

DATE

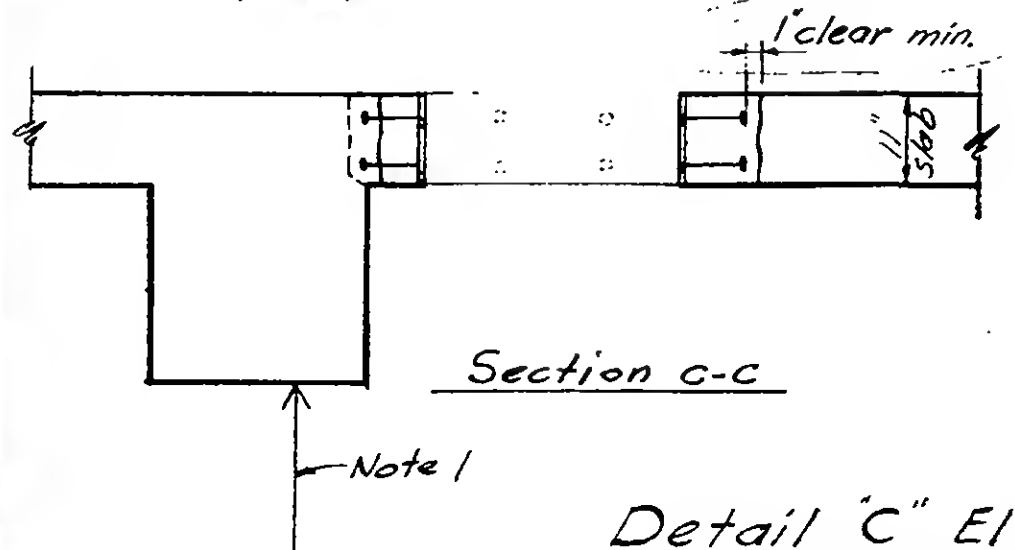
5-4-72

REVISIONS

6-23-72

Notes:

1. Slabs and beams to be shored as required before removing exist. concrete.
2. Remove existing concrete to line indicated without damaging existing reinf.
3. Cut exist. reinf. and hook clear of new pipe sleeve.
4. Install new Pipe Sleeve 32" φ O.D. API 5L pipe with .50 wall thickness with 3/4" φ x 7 5/8" headed concrete anchors spaced as indicated.
5. Add new reinf. as indicated.
6. Clean face of exist. concrete on thoroughly coat entire surface with epoxy bonding compound.
7. Cast slab to edge of new opening using approved "non shrink" $f'_c = 4000$ psi concrete.

Detail "C" El 284Detail "D" El 294

DESIGNED

DRAWN

REVIEWED

19-K-1068.2

PROJECT

THE WORLD TRADE CENTER

TITLE

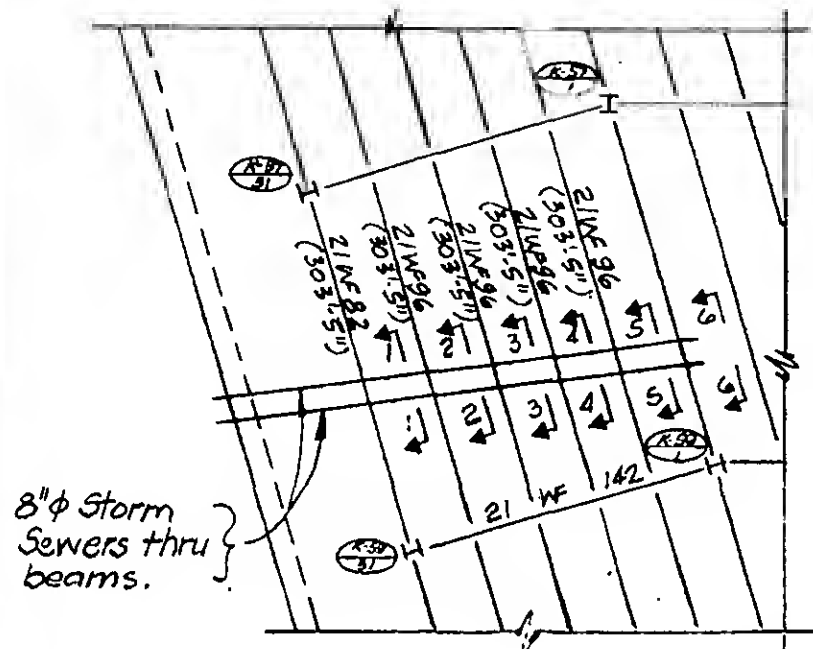
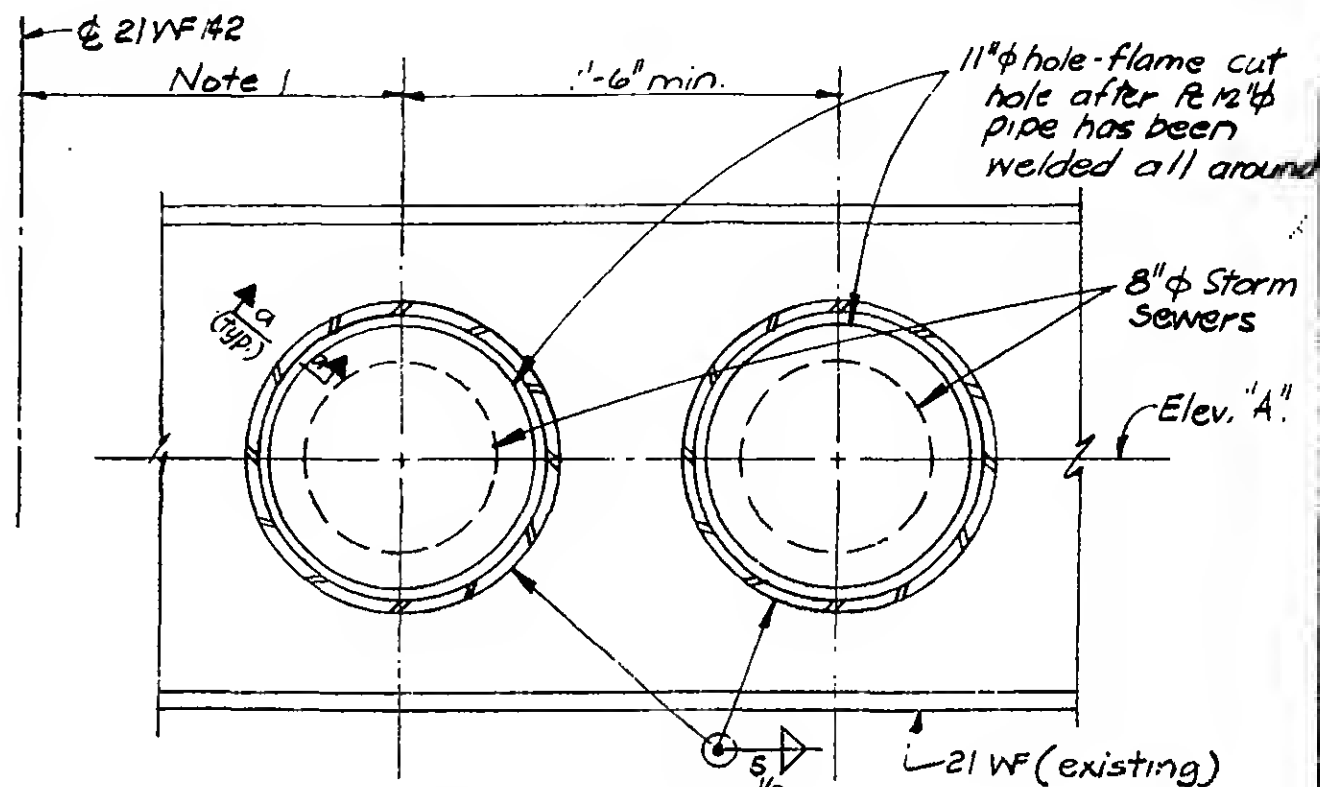
OPENINGS IN BEAMS FOR STORM SEWER PIPES - ZONE K5

DATE

5-12-72

REVISIONS

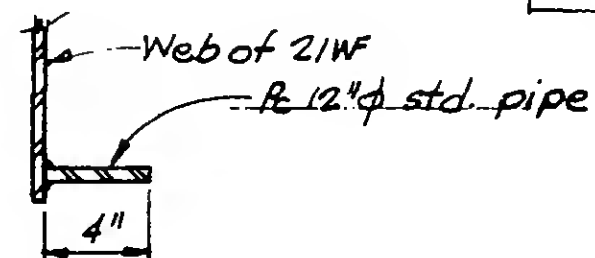
NORTH

8" ϕ Storm
Sewers thru
beams.Key Plan Zone K-5

Note: 1. 8'-0" min., 22'-0" max. See PNYA
Dwgs. for location.

View 1 thru 6

| | Elev. "A" |
|--------|-------------------------|
| View 1 | 302'-4 $\frac{1}{4}$ " |
| View 2 | 302'-5 $\frac{1}{16}$ " |
| View 3 | 302'-6 $\frac{1}{16}$ " |
| View 4 | 302'-6 $\frac{1}{16}$ " |
| View 5 | 302'-7 $\frac{3}{8}$ " |
| View 6 | 302'-8" |

Section a-a

DESIGNED

JTM

DRAWN

P. H. H. H.

REVIEWED

10/10/72

19-K-1069

PROJECT

THE WORLD TRADE CENTER

TITLE

NEW OPENINGS - EL. 294'-0"

DATE

11-7-72

REVISIONS

K-46
52

N4492.00

2-#4x3'-0"
ea. corner

4'-0"±

3-#5 t&b x 8'-0"

2-#5 t&b x 6'-6"

Note 3

2-#5 t&b x 6'-6"

11" Flat slab

Slurry wall

New opening in slab not yet cast

Part Plan El. 294

Zone K-4

52

N4405.50

9'-10"

4'-0"±

3-#5 t&b Note 4

Note 2 & 5

2-#4 t&b Note 4

Note 3

Note 6

2-#4 t&b Note 4

11" Flat slab

2-#4x3'-0"
ea. corner
Note 4

Slurry wall

Part Plan El. 294

Zone K-6

2-#4x3'-0"
Note 44-#5 t&b
Note 4
Note 2 & 5

Note 3

Note 6

2-#4x3'-0"
Note 4

12WF92

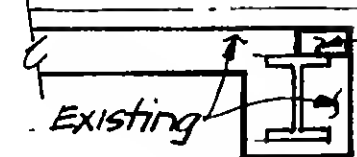
1-#4 t&b
Note 4

Exist. opng.

Part Plan El. 294

Tower B

El. 294'-0"



Existing

Note 2 & 5

Section X-X

Notes:

1. Slabs to be shored as required before removing existing concrete.
2. Remove existing concrete to line indicated without damaging existing reinf.
3. Cut existing reinf. and hook at edge of opening.
4. Add new reinf. as indicated.
5. Clean face of existing concrete and thoroughly coat entire surface with epoxy bonding compound.
6. Cast slab to edge of new opening using approved "non-shrink" f'c = 4000psi concrete.



DESIGNED

WAB

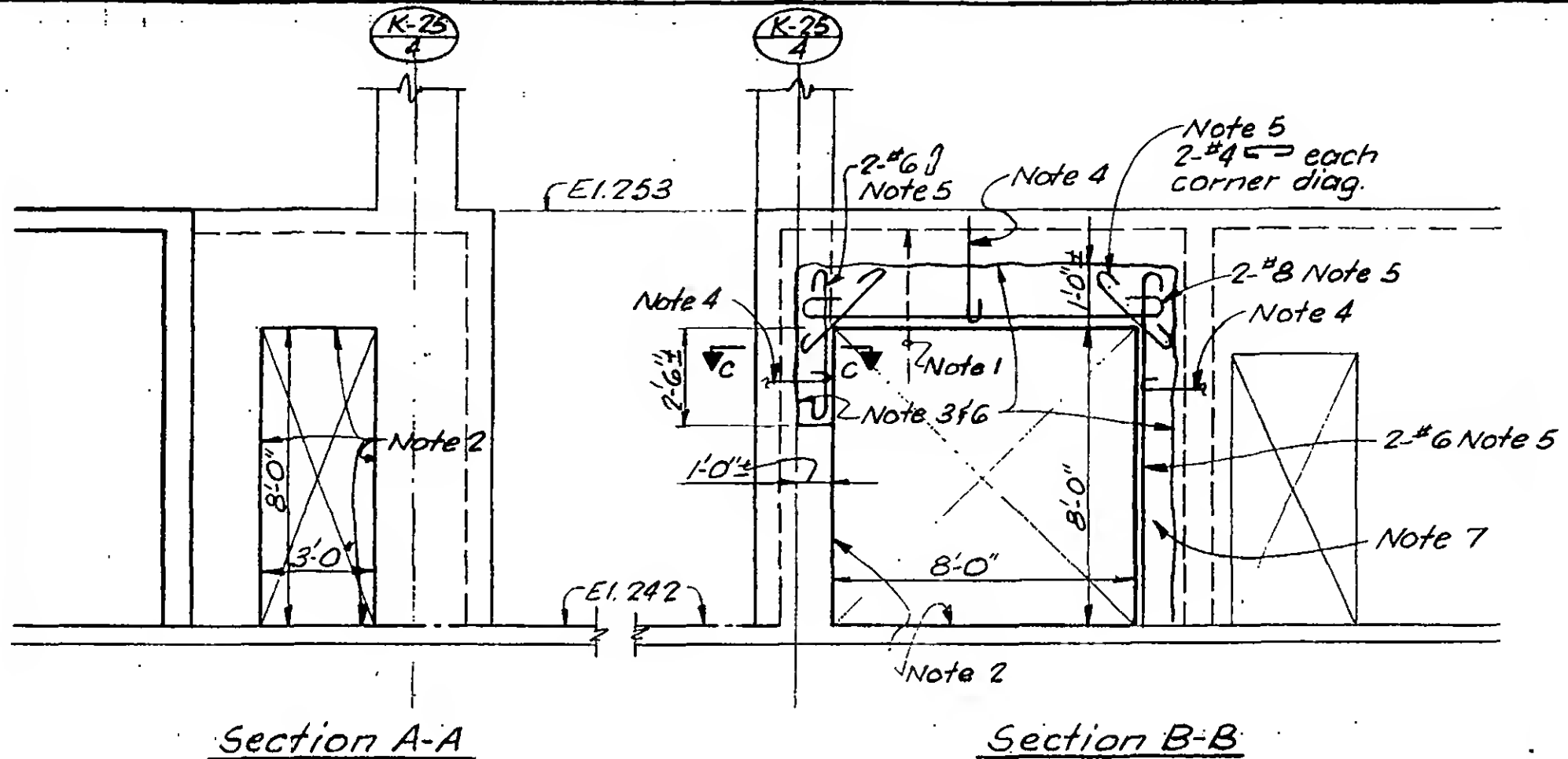
DRAWN

P. H. W. L. I.

REVIEWED

19-BK-1070

REVISIONS



Note 1. Shore slab adjacent to wall as required before removing wall.

Note 2. Remove existing concrete to clean smooth line as shown.

Note 3. Remove existing concrete to line indicated without damage to existing reinforcing.

Note 4. Cut existing reinforcing and hook at edge of new opening.

Note 5. Add new reinforcing as indicated.

Note 6. Clean face of existing concrete and thoroughly coat entire surface with approved epoxy bonding compound.

Note 7. Cast wall to edge of new opening, using approved "non-shrink" $f_c = 4000$ psi concrete.

Note 8. See SCK-20 for plan.



DESIGNED

WAB

DRAWN

TR

REVIEWED

1/10/82

10.K-1072

PROJECT

THE WORLD TRADE CENTER

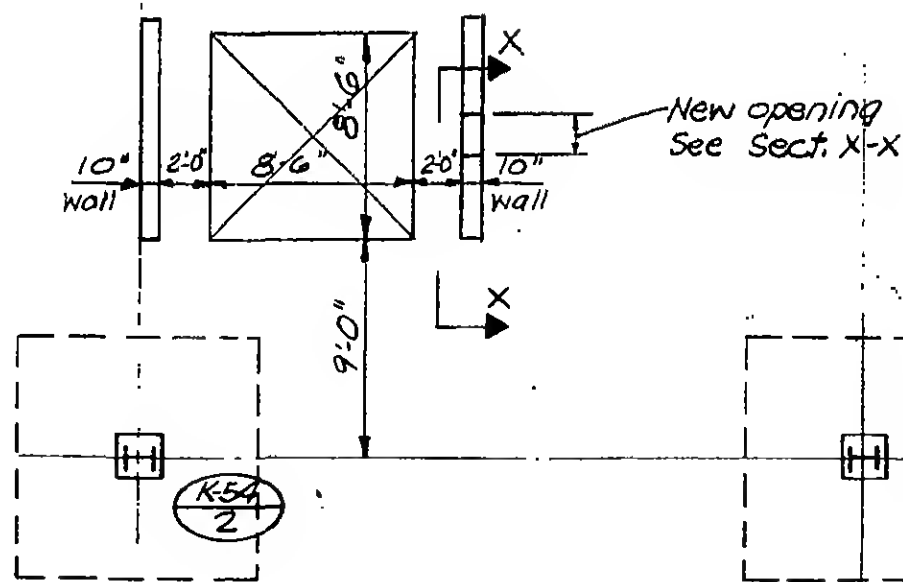
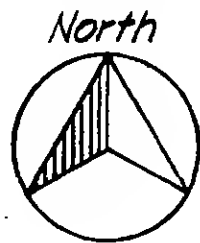
TITLE

WALL OPENING - EL. 284 - ZONE K6

DATE

1-18-73

REVISIONS

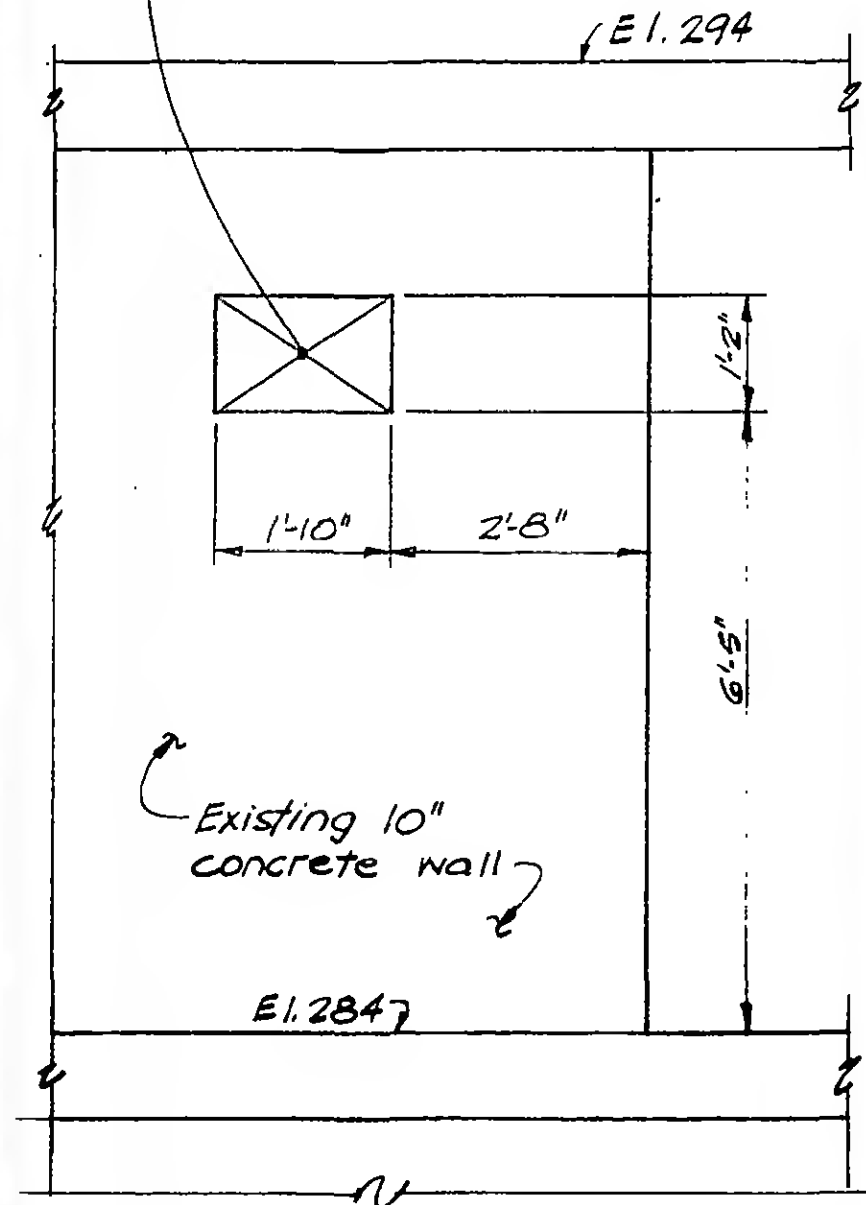


Part Plan El. 284

Zone K6

PNYA C.O. 720.015

New opening
cut concrete &
reinforcing to smooth
clean edge.



Section X-X

19-K-1074



DESIGNED

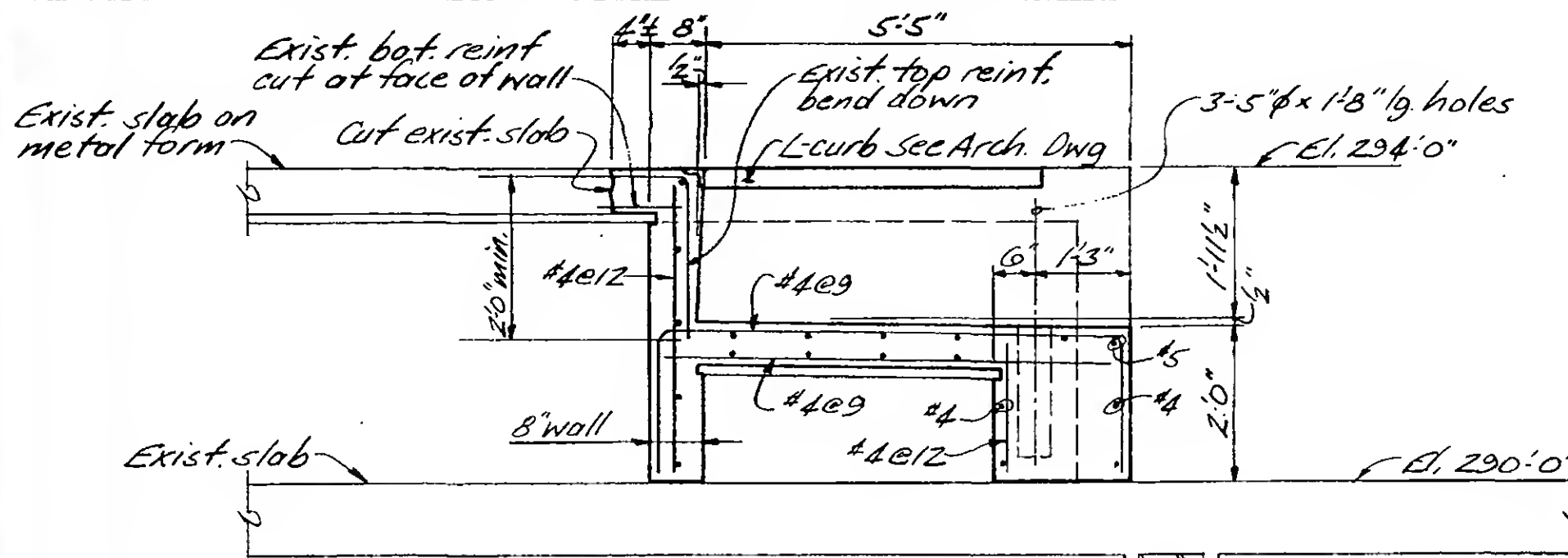
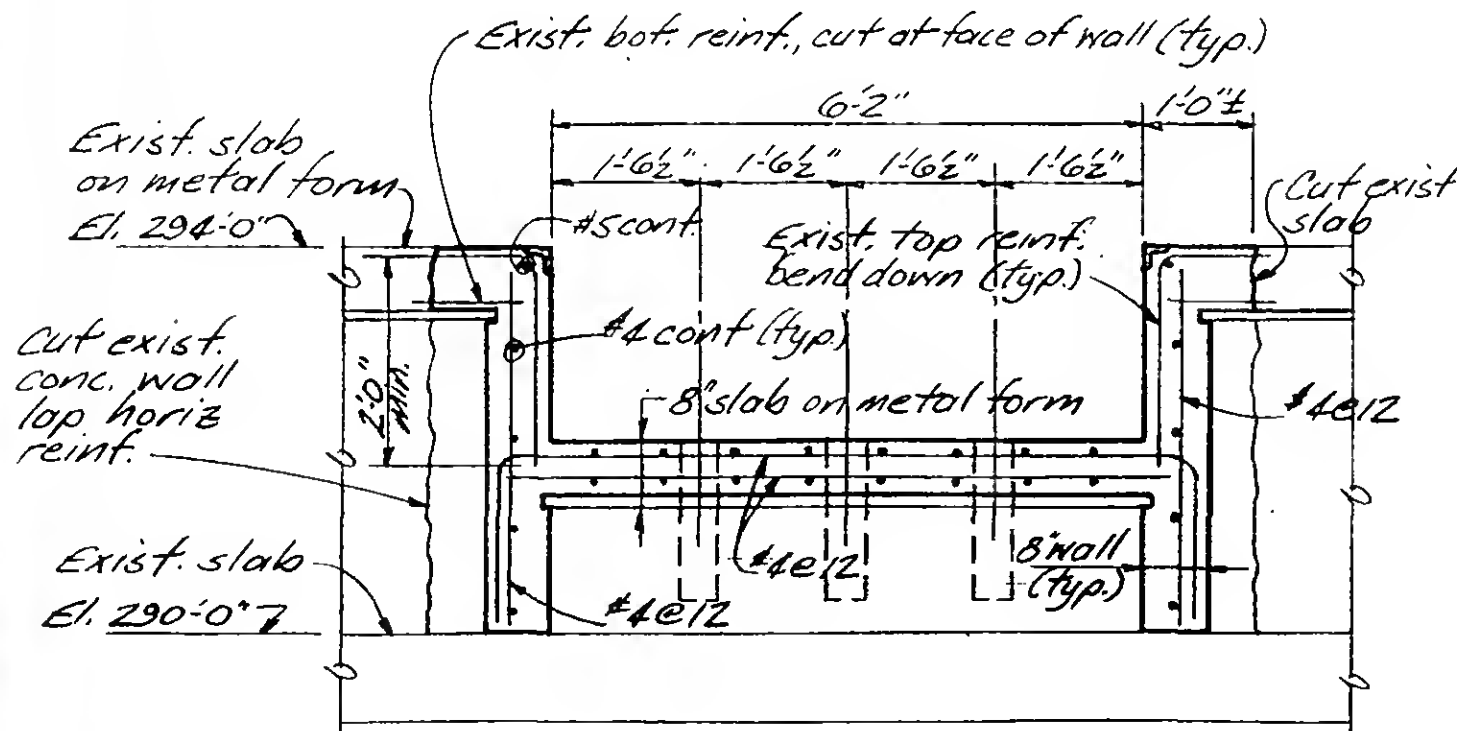
DRAWN

P. W. W. L.

REVIEWED

PROJECT THE WORLD TRADE CENTERTITLE RELOCATED TRUCK PIT, ZONE J-G, EL. 290-294DATE 4-12-73

REVISIONS

Section A-ASection B-BNotes:

1. Keep live load on El. 294 at least 10' away from this area until work is completed and concrete cured.
2. Remove exist. conc. wall and El. 294 slab to line indicated without damaging exist. reinf.
3. Add new reinf. as indicated.
4. Clean face of exist. conc at joint and thoroughly coat entire surface with epoxy bonding compound.
5. Cast new concrete as shown using approved non-shrink, $f'_c = 4000$ psi concrete.



DESIGNED

JTM

DRAWN

JA

REVIEWED

19-JK-1075.1

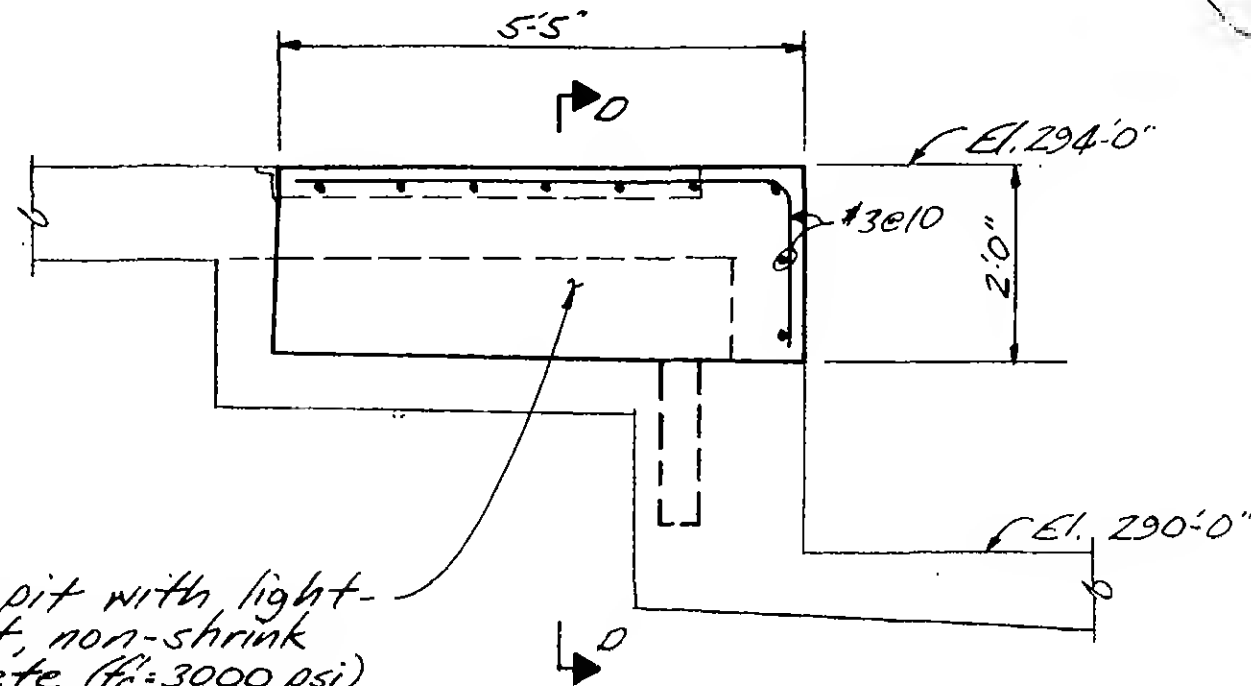
PROJECT THE WORLD TRADE CENTER

TITLE RELOCATED TRUCK PIT, ZONE K-2 EL. 290-294

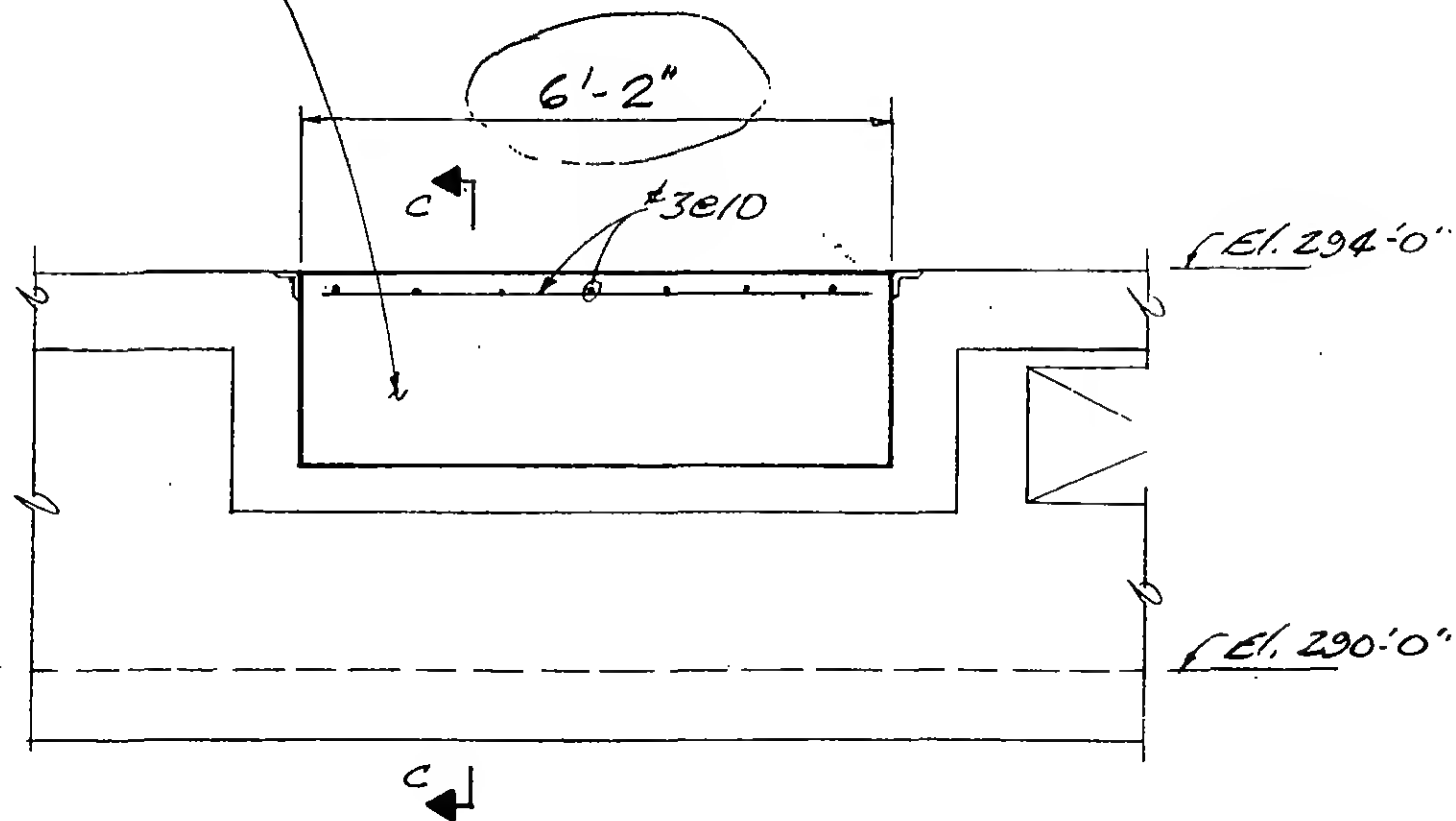
DATE 4-12-73

REVISIONS

4/26/73



Fill in pit with light-weight, non-shrink concrete ($f'_c = 3000$ psi) flush with top and sides of pit.

Section C-CSection D-D

DESIGNED

JTM

DRAWN

HA

REVIEWED

19-JK-1075.2

PROJECT

THE WORLD TRADE CENTER

TITLE

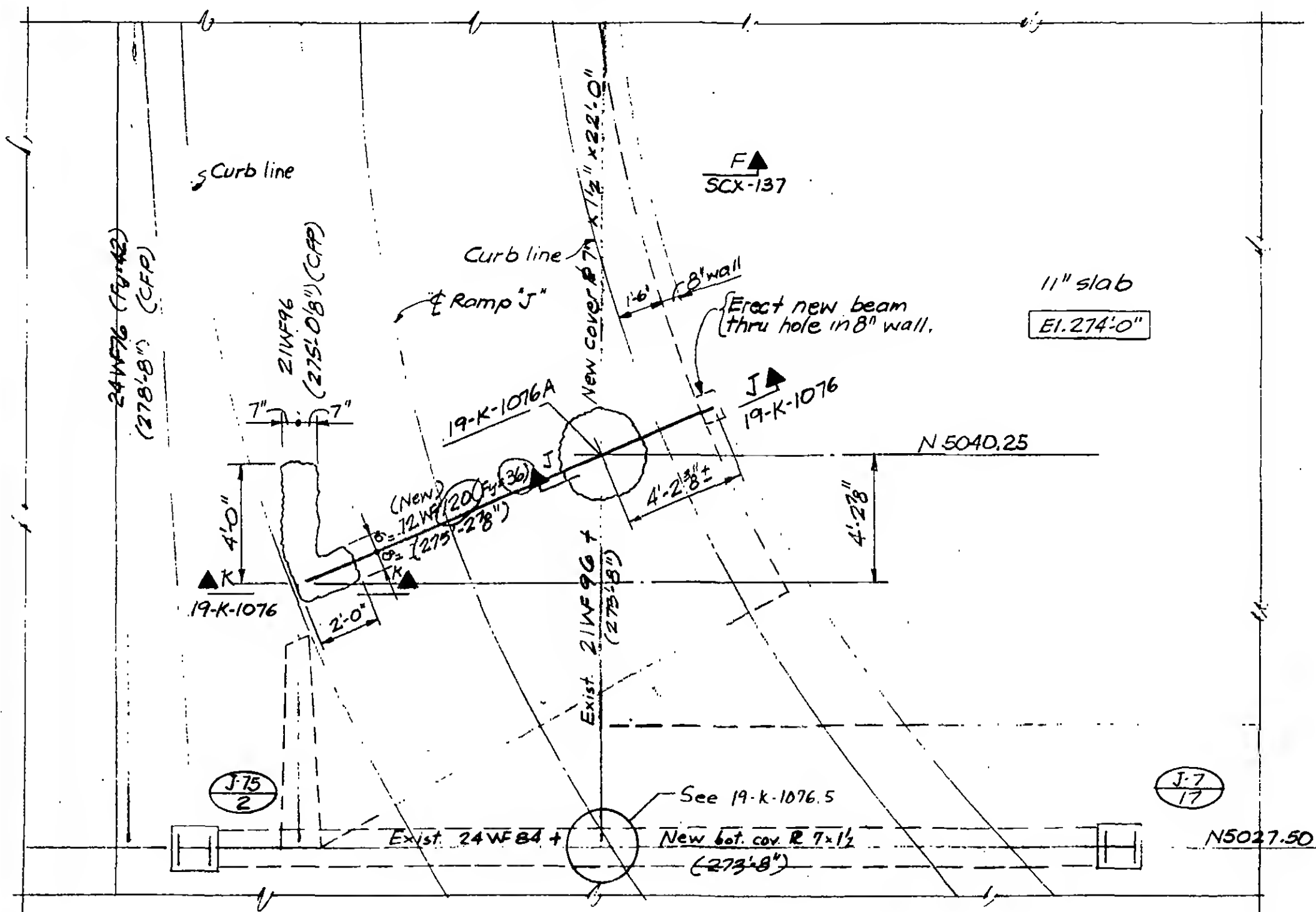
EL. 274, ZONE J-4, RAMP J REINFORCEMENT

DATE

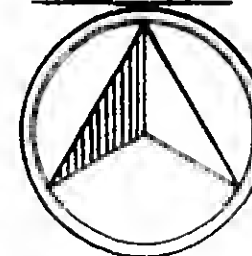
5-8-73

REVISIONS

9-7-73

Part Plan Ramp "J"

Follow construction sequence shown in section J-J.

NorthDESIGNED
JTMDRAWN
PMO:ali

REVIEWED

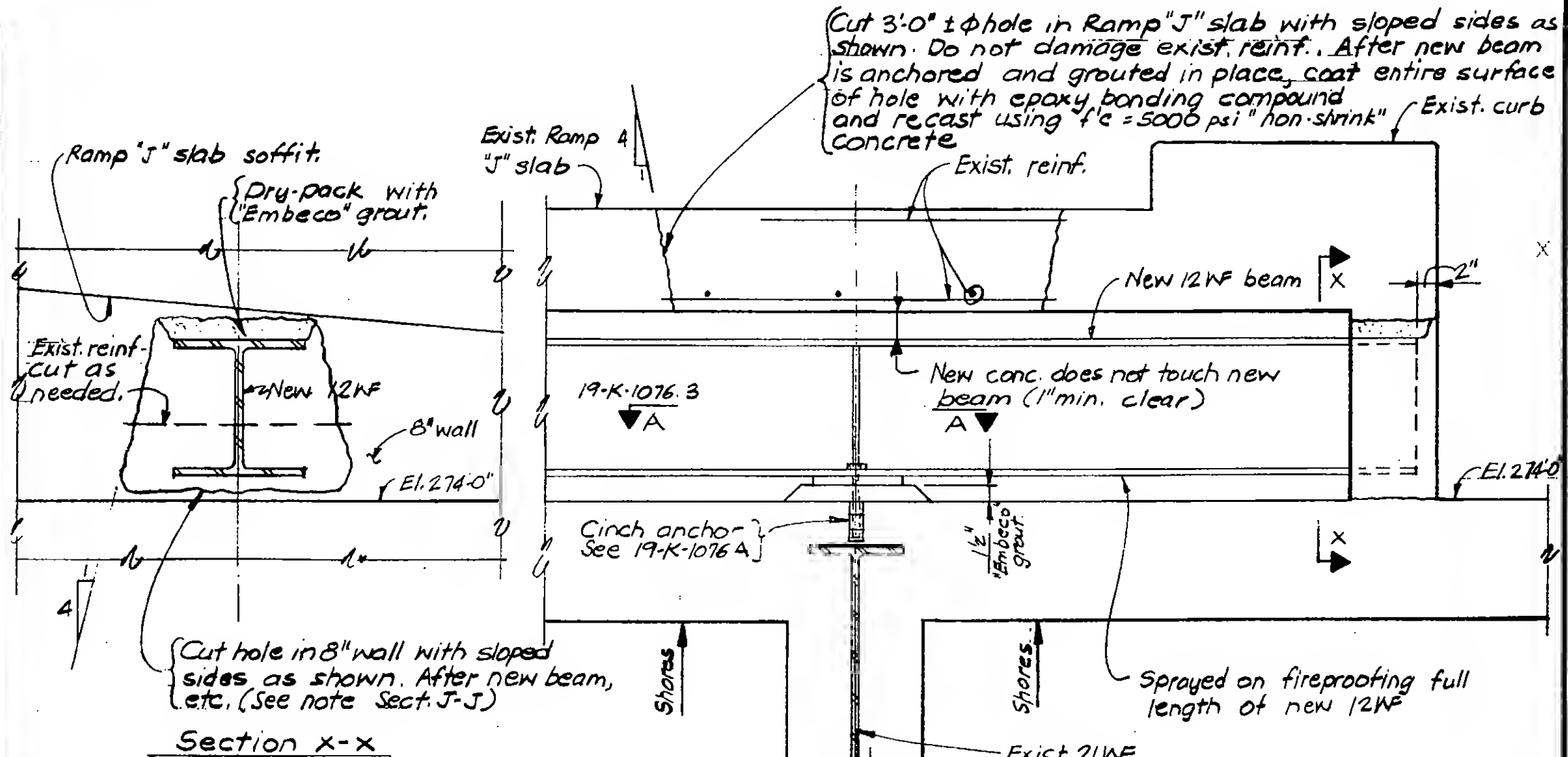
19-J-1076.1

PROJECT THE WORLD TRADE CENTER

TITLE EL. 274, ZONE J-4, RAMP J REINFORCEMENT

DATE 5-8-73

REVISIONS

Construction Sequence:

1. Place shores, full length of exist. 21WF.
2. Cut fireproofing off bottom face of exist. 21WF as shown. Do not damage exist. reinf.
3. Cut exist. #3 @ 6 stirrups as shown (1 cut ea. bar) & bend only enough to install & weld new cover ϕ . Clean exposed bottom flange of exist. 21WF
4. Install & weld new cover ϕ , bend stirrups back as shown, dry-pack beam soffit.
5. Complete all other work shown on 19-K-1074 drawings.
6. Remove shores.

Section J-JDESIGNED
J.T.M.DRAWN
P.M. Oulu

REVIEWED

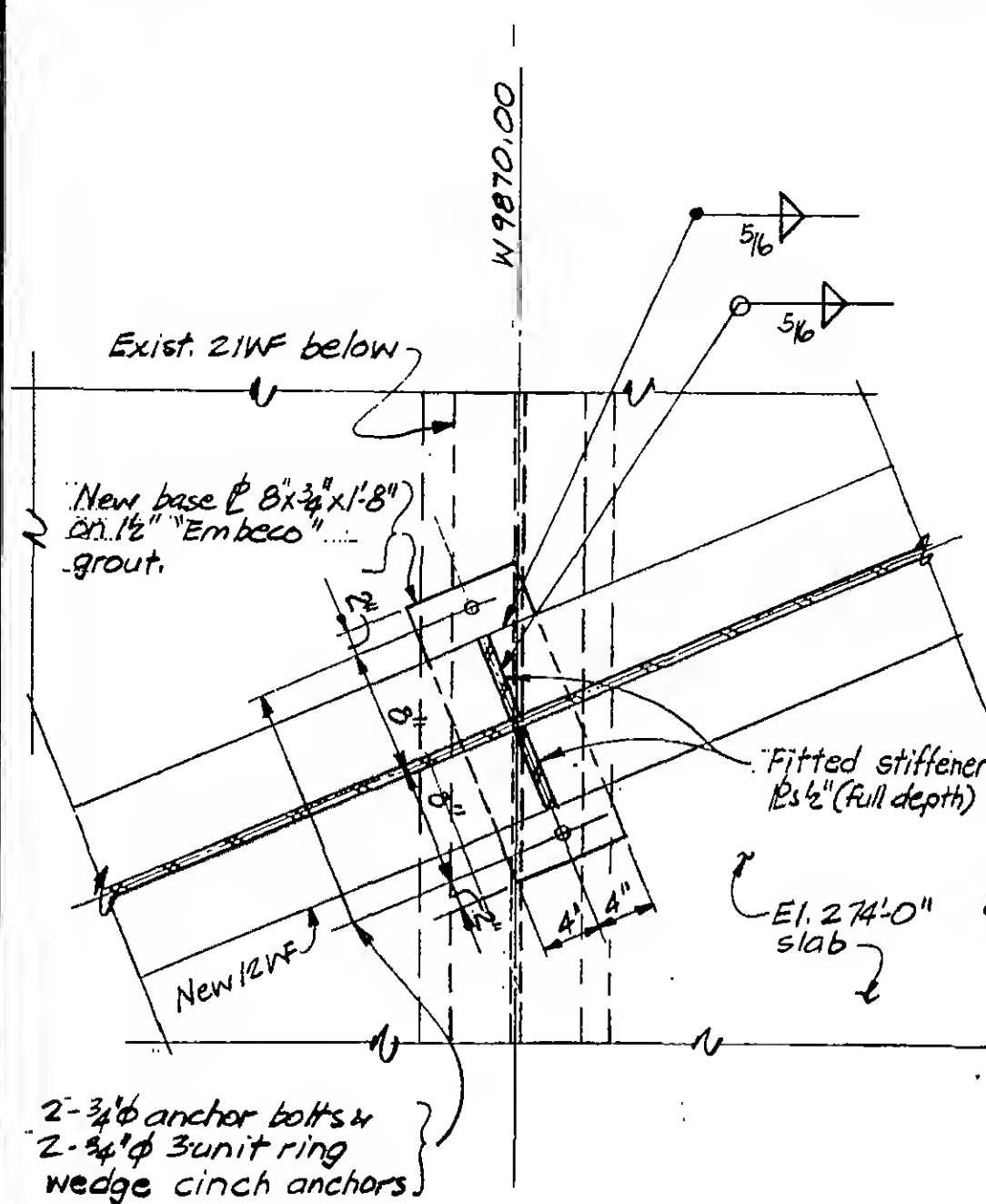
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PROJECT THE WORLD TRADE CENTER

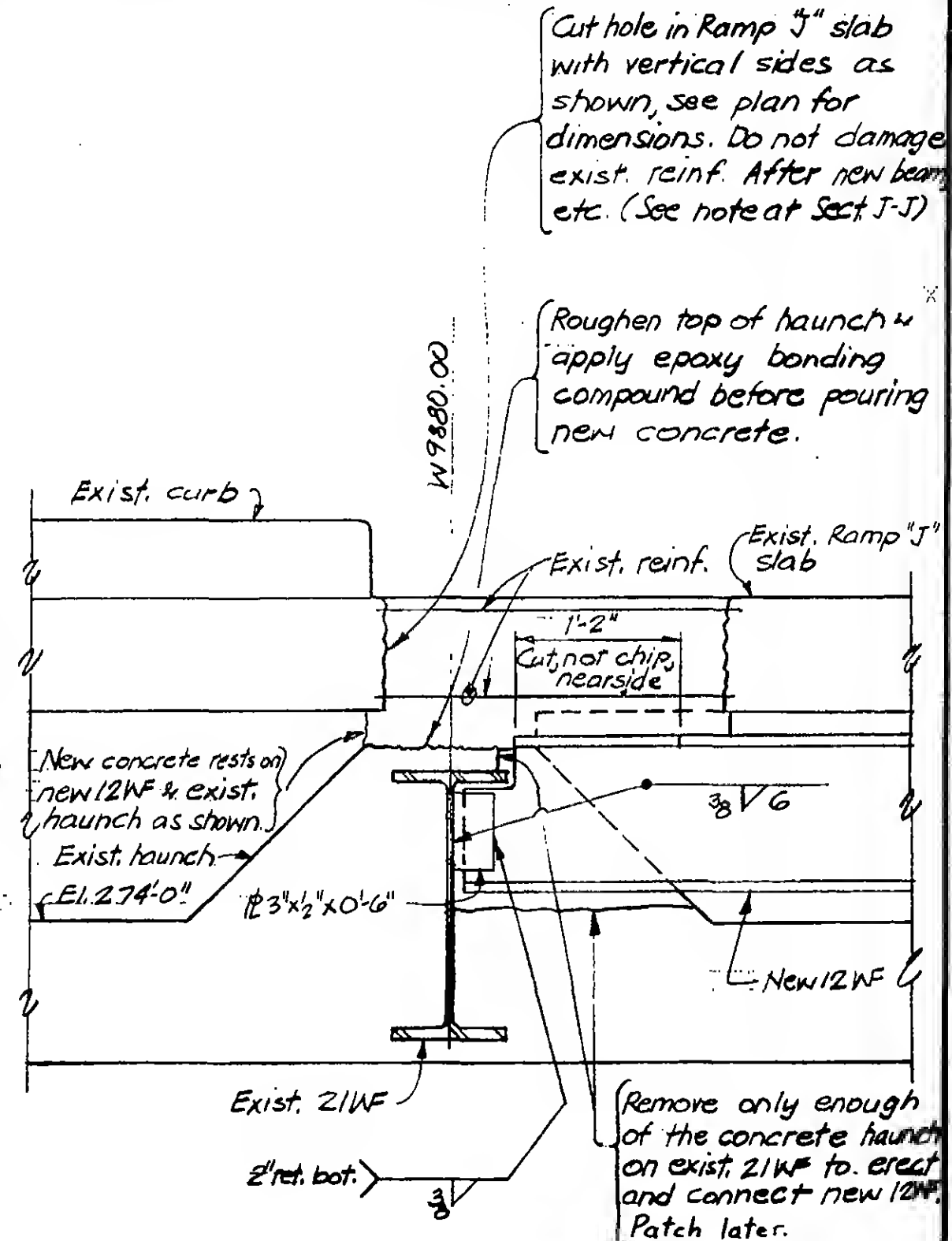
TITLE EL 274, ZONE J-4, RAMP J REINFORCEMENT

DATE 5-8-73

REVISIONS



Detail A



Section K-K



DESIGNED

JTM

DRAWN

PHD Ocker

REVIEWED

19-J-1076.3

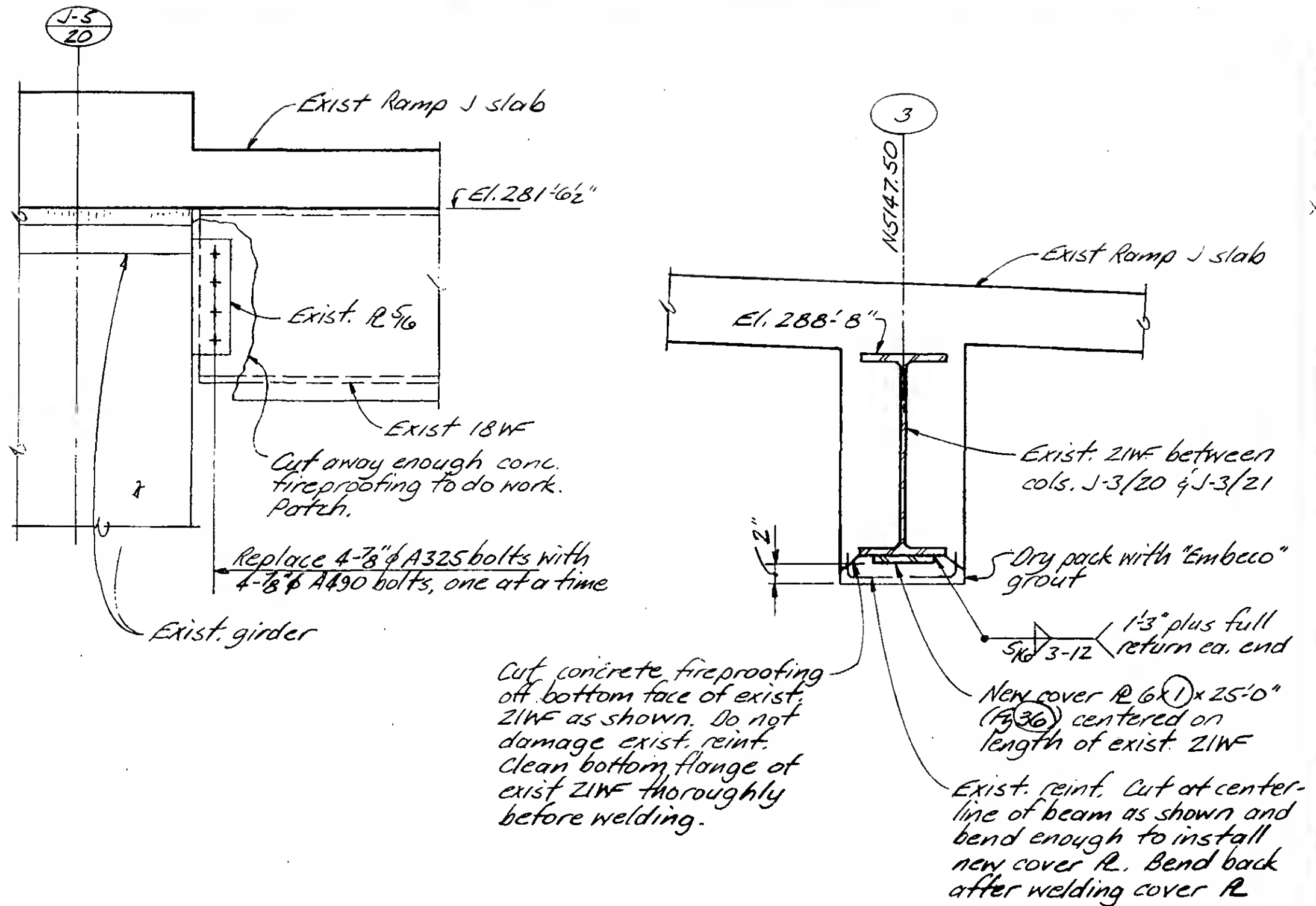
PROJECT THE WORLD TRADE CENTER

TITLE ZONE J-2, RAMP J REINFORCEMENT

DATE 5-8-73

REVISIONS

9-7-73



DESIGNED

JTM

DRAWN

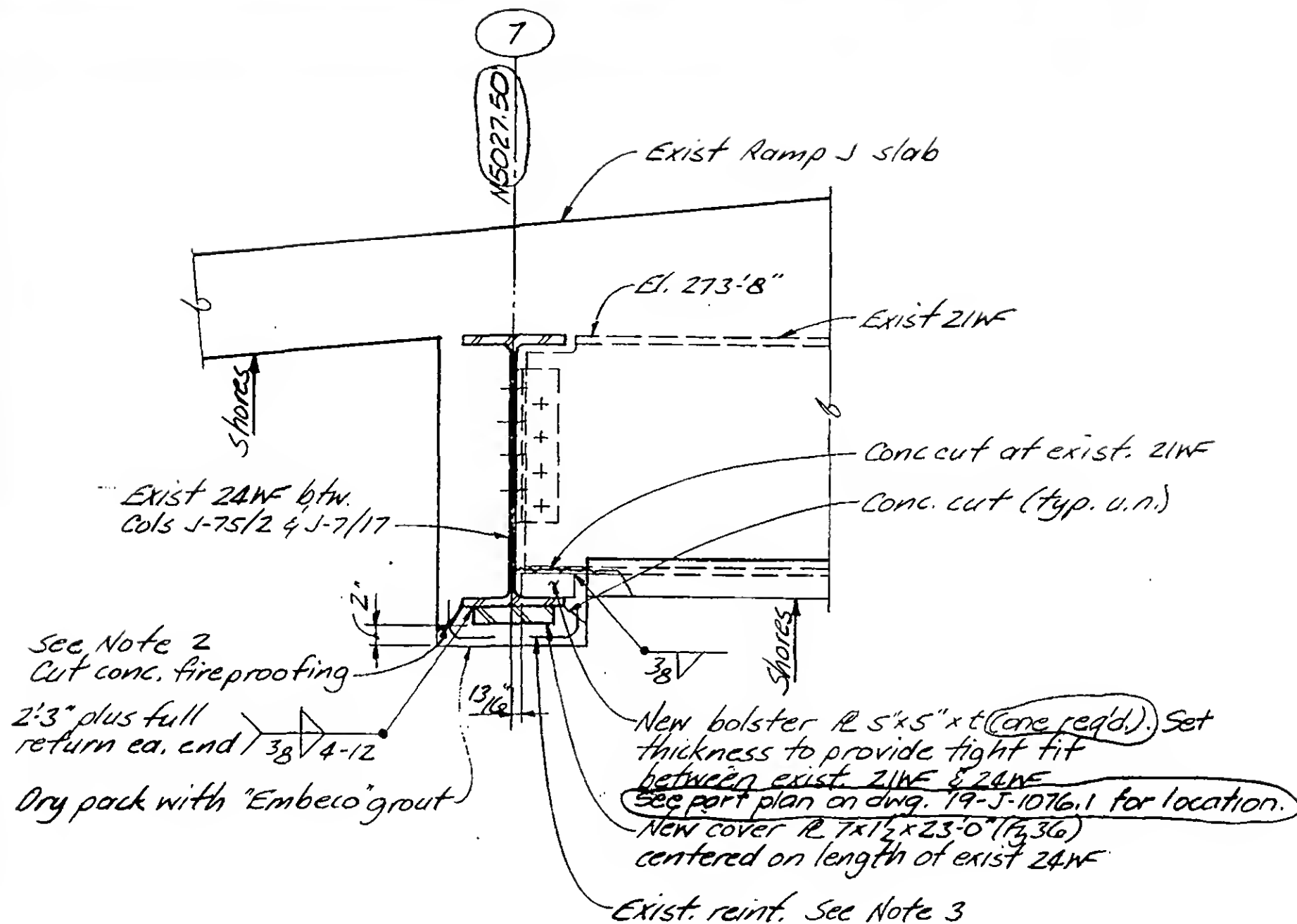
R

REVIEWED

19-J-1076.4

REVISIONS

5-24-73



Notes:

1. Place shores before work begins and remove shores after work is complete.
2. Cut concrete fireproofing off bottom face of exist. 24WF as shown. Do not damage exist. reinf. Clean bottom flange of exist. 24WF thoroughly before welding.
3. Exist. reinf. cut at centerline of beam as shown and bend enough to install new cover plate. Bend back after welding cover plate.



DESIGNED

JTM

DRAWN

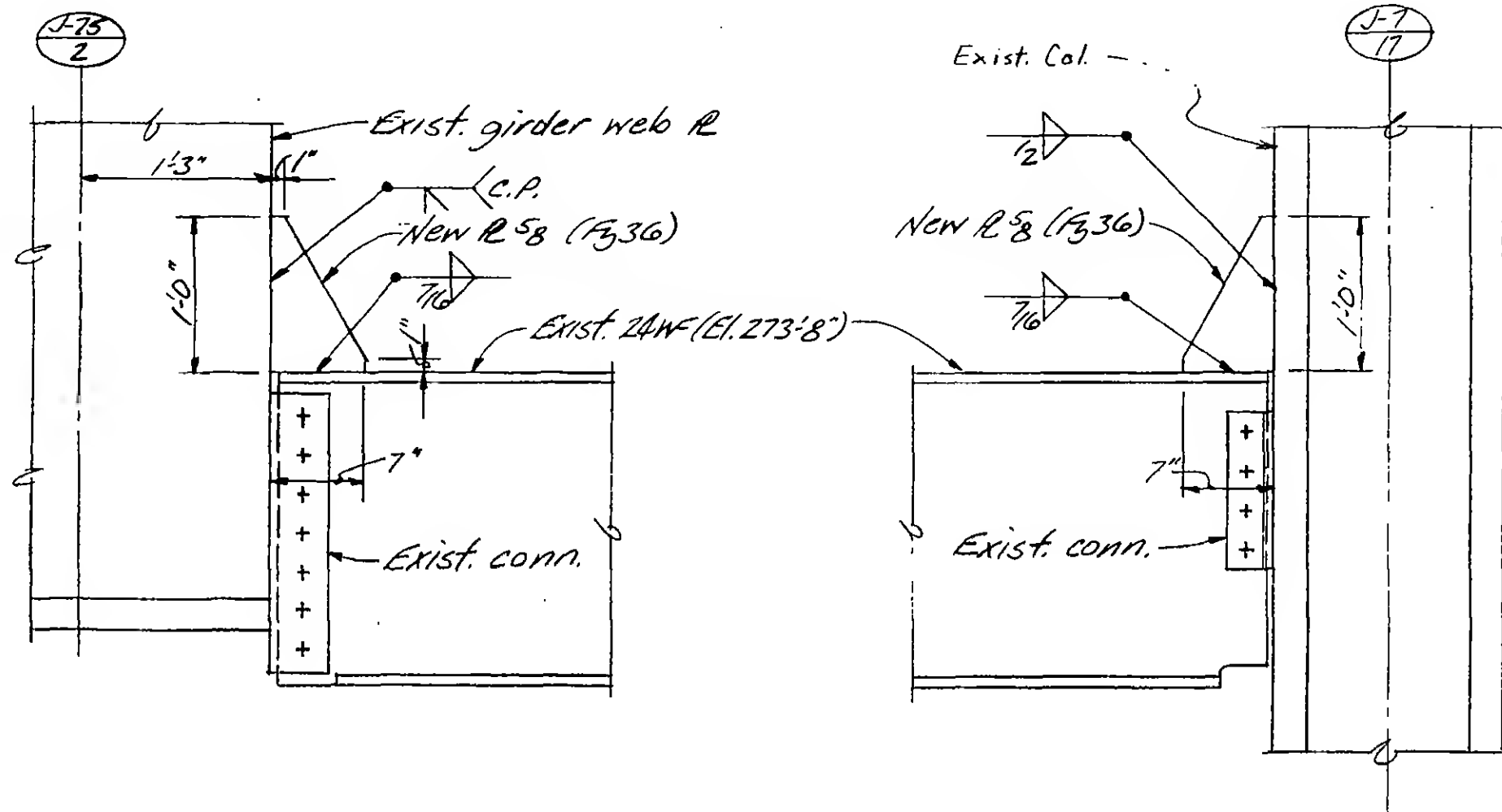
JA

REVIEWED

19-J-1076.5

PROJECT *THE WORLD TRADE CENTER*TITLE *EL. 274, ZONE J-4, RAMP J REINFORCEMENT*DATE *5-8-73*

REVISIONS

Notes:

1. Chip concrete fireproofing (not shown) away as necessary to weld on new R.
2. Clean steel surfaces to be welded.
3. Patch concrete fireproofing after welding is completed.



DESIGNED

JTM

DRAWN

JA

REVIEWED

19-J-1076.6

PROJECT

THE WORLD TRADE CENTER

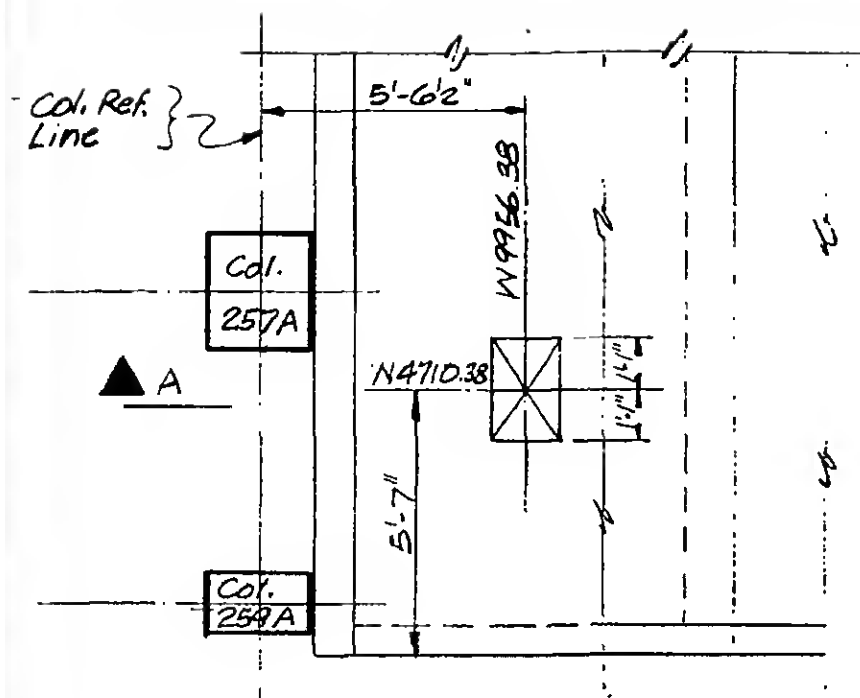
TITLE

NEW OPENING IN SLOPING SLAB - ZONE J-6

DATE

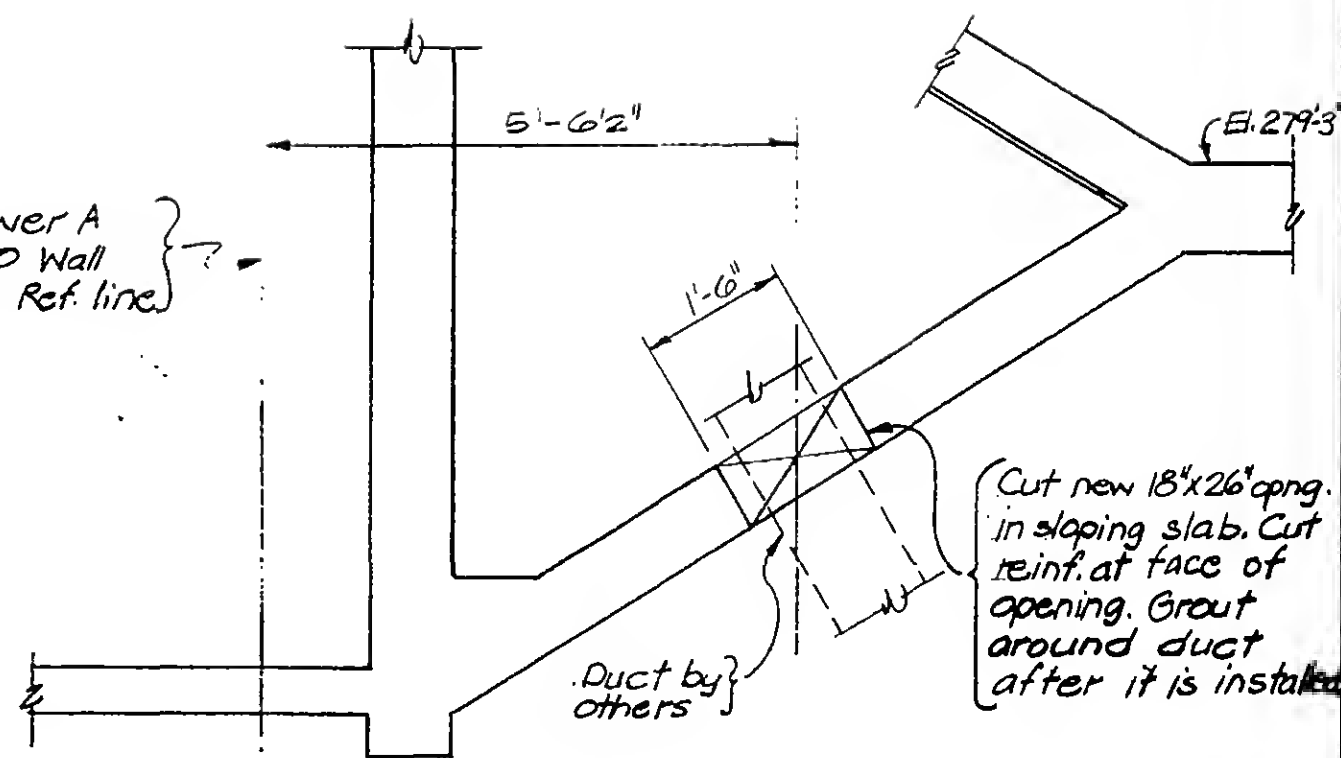
5-15-73

REVISIONS



Part Plan
New Opening in Sloping Slab

Tower A
200 Wall
Col. Ref. line



Section A-A



DESIGNED

JTM

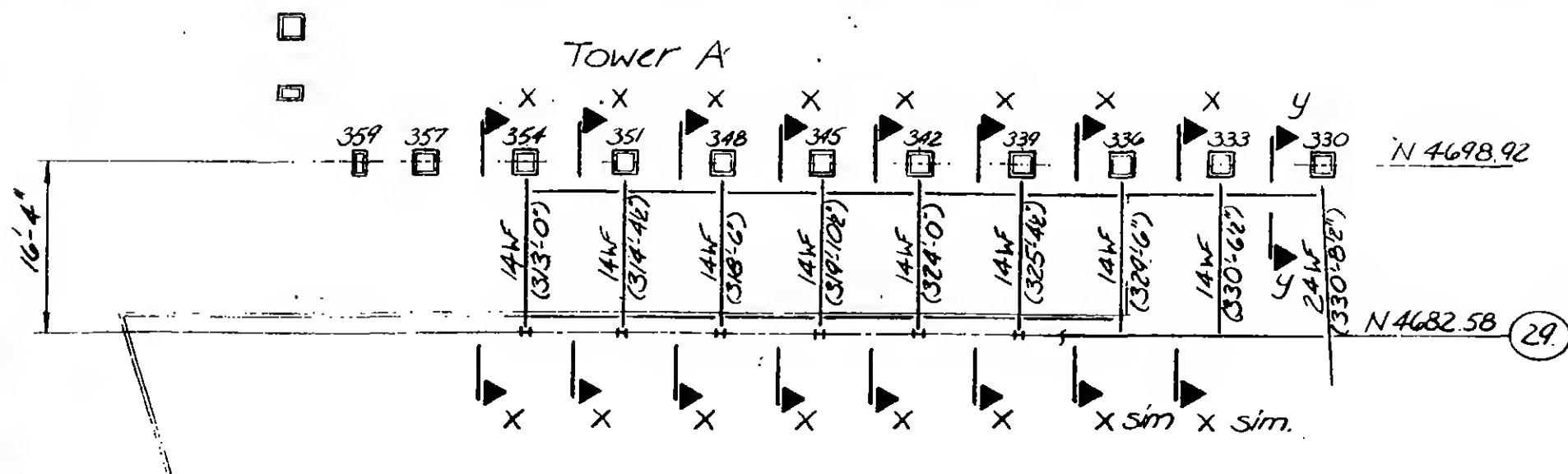
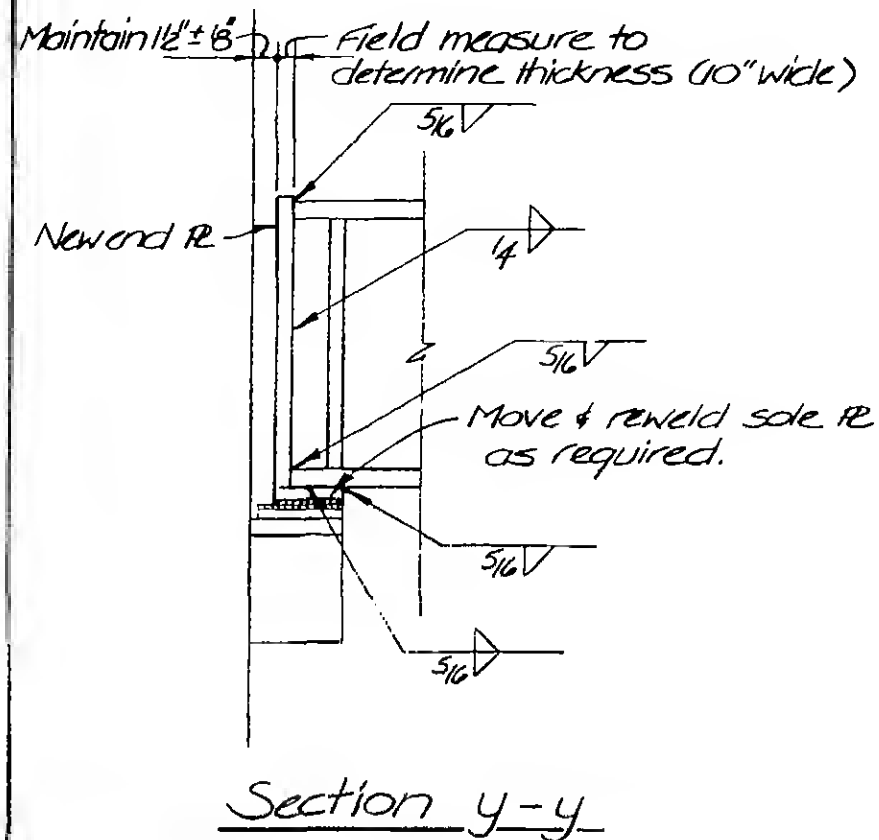
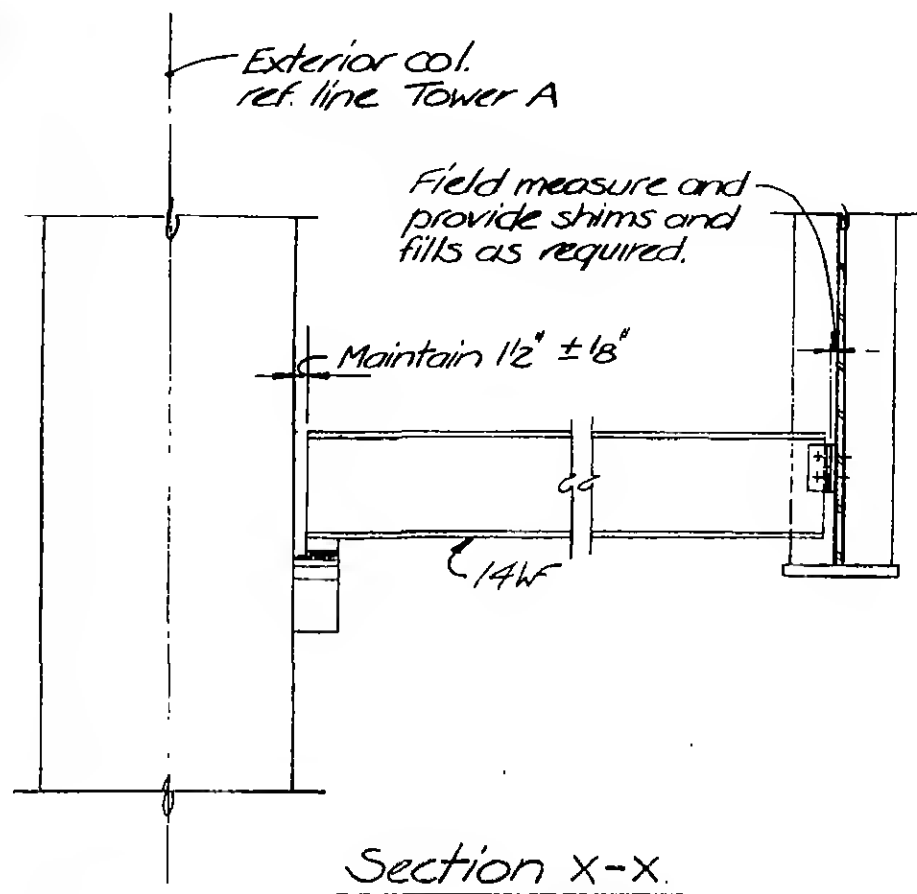
DRAWN

McGee

REVIEWED

19-J-1077

REVISIONS



DESIGNED

DRAWN

J. Banks

REVIEWED

KEY PLAN
Refer Drawing SK-104

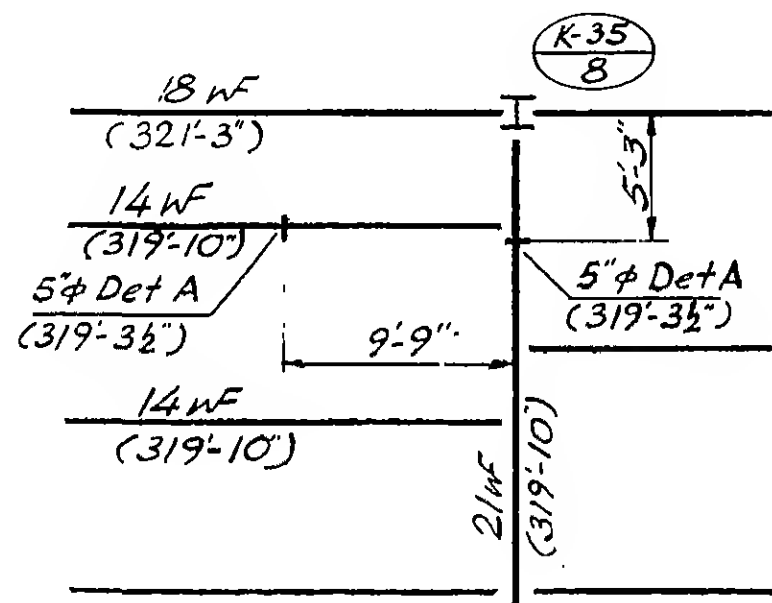
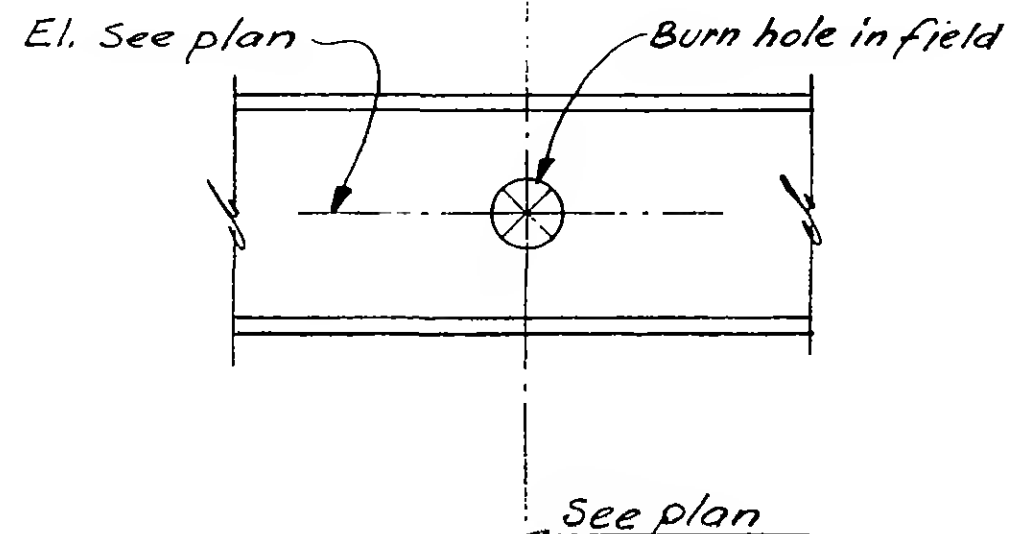
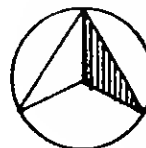
19-K-1078

SKILLING, HELLE, CHRISTIANSEN, ROBERTSON

Structural & Civil Engineers

PROJECT *THE WORLD TRADE CENTER*TITLE *HOLES IN BEAMS - EL. 320 MEZZANINE - ZONE K1*DATE *8-16-73*

REVISIONS

Note See SK-97 for basic plan.*North*

A



DESIGNED

DRAWN

REVIEWED

19-K-1079

PROJECT

THE WORLD TRADE CENTER

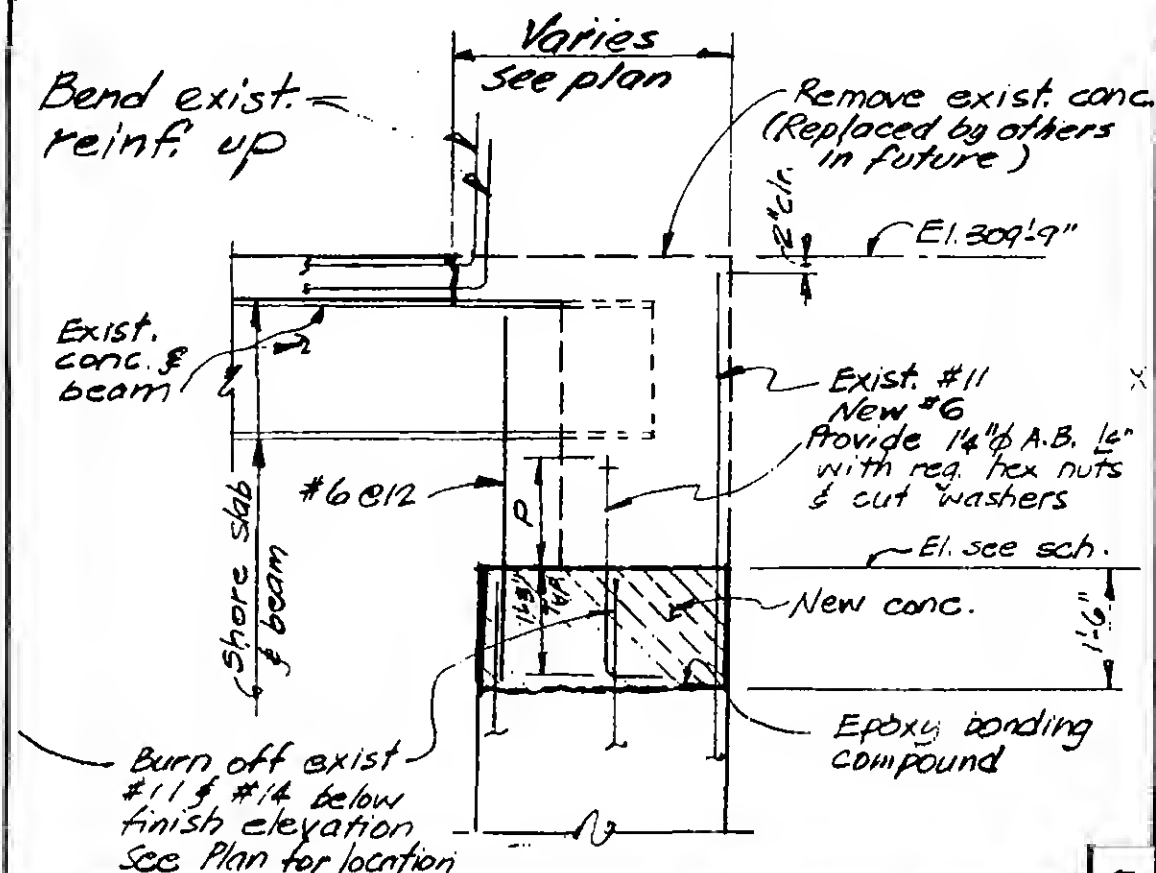
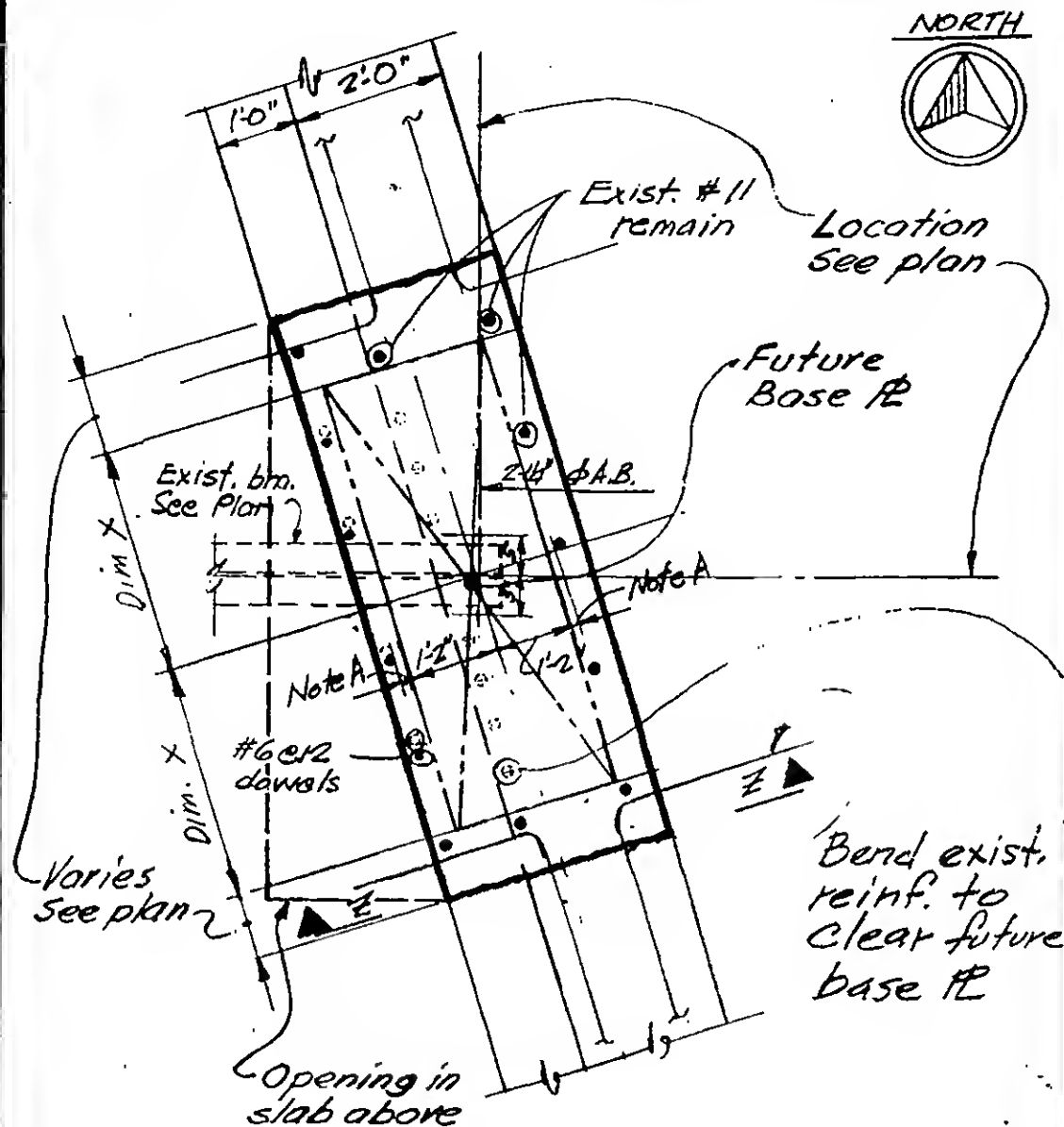
TITLE

REPAIR OF SLURRY WALL AT SE.P.B COLUMN BASES

DATE

1-10-74

REVISIONS



Construction Sequence

1. Shore exist. slab and beam before removal of concrete. Maintain shores until approved by Engineer.
2. Remove existing concrete as shown in plan and Section Z-Z. without damage to exist. reinforcing.
3. Burn off #11 & #14, see Plan & Section Z-Z.
4. Roughend and clean entire surface of exist. conc. which will come in contact with new concrete.
5. Place #6 & 1/4" Anchor Bolts, see Plan for location.
6. Coat entire surface of existing concrete with approved epoxy bonding compound.
7. Cast wall to elevation in schedule using approved "non-shrink" $f'_c = 4000$ psi. concrete.

Notes:

- * Maintain 1" clearance between vert. reinf. bars and 1'-2" dimension given in plan. Where #11 bars encroaches upon 1'-2" dimension, burn off #11 bars below finish wall elevation and lap #6 @ 12 with #11.



DESIGNED

DRAWN

REVIEWED

| ANCHOR BOLT PROJECTION 'P' | THREAD | ELEVATION | DIMENSION 'X' | DET. No. |
|----------------------------|--------|-----------|---------------|----------|
| 1'-1/2" | 0'-11" | 307'-2" | 1'-4 1/2" | A |
| 1'-6 1/2" | 1'-4" | 306'-5" | 3'-7" | B |
| 1'-1/2" | 0'-11" | 307'-1" | 1'-9" | C |
| 1'-1/2" | 0'-11" | 307'-0" | 2'-0" | D |
| 1'-1/2" | 0'-11" | 306'-2" | 2'-6" | E |
| 1'-1/2" | 0'-11" | 303'-6" | 1'-7 1/2" | F |

19-K 1080

PROJECT THE WORLD TRADE CENTER

TITLE REPAIR DETAIL FOR BEAM ENDS - EL. 332, ZONE K3

DATE 1-9-74

REVISIONS

New end ϕ
(stiffener)
"L" 9"x $\frac{1}{2}$ "x0'-9"
"M" 6"x $\frac{1}{2}$ "x0'-9"

Fit new end ϕ
to bear on sole
 ϕ

Remove existing
sole ϕ from bottom
flange of beam.
Relocate as shown
($\frac{1}{2}$ " from column
face) and reweld
as shown.

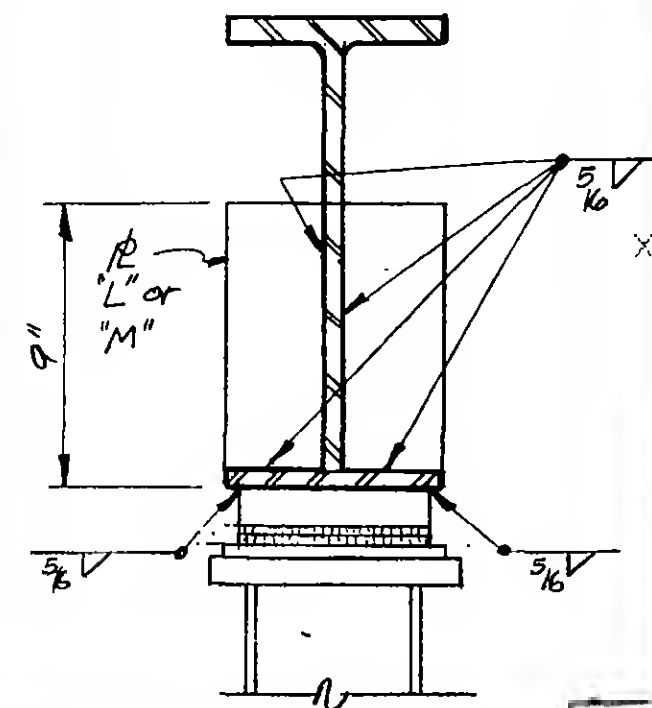
Tower B column face

A B

Existing 24 WF or 14 WF beam

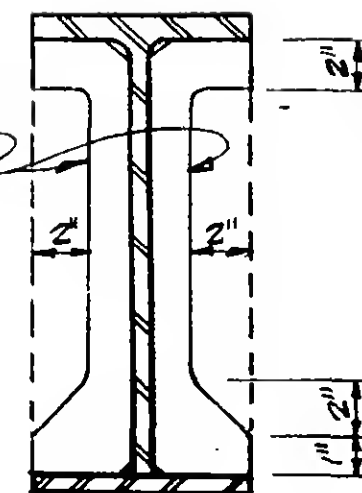
Trim existing stiffener plates
if required for welding access
as shown in Section B-B.

Existing beam seat



A

Trim exist.
stiffener ϕ s
if required
for welding
access



B

Elevation View Looking South

| COLUMN NUMBER | BEAM NUMBER | " ϕ " |
|---------------|-------------|------------|
| 159 - B | B - 6101 | L |
| 157 - B | B - 6097 | L |
| 154 - B | B - 6098 | L |
| 151 - B | B - 6100 | L |
| 148 - B | B - 6099 | L |
| 145 - B | B - 6098 | L |
| 142 - B | B - 6102 | L |
| 139 - B | B - 6198 | M |
| 136 - B | B - 6194 | M |
| 133 - B | B - 6240 | M |



DESIGNED AR

DRAWN P.H. Li

REVIEWED JTM

19-K-1081

PROJECT

THE WORLD TRADE CENTER

TITLE

EL. 332, ZONE K-5, REPAIR AT E. FACE OF COL. (K-57/4)

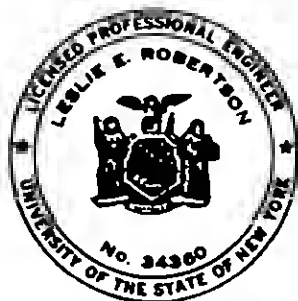
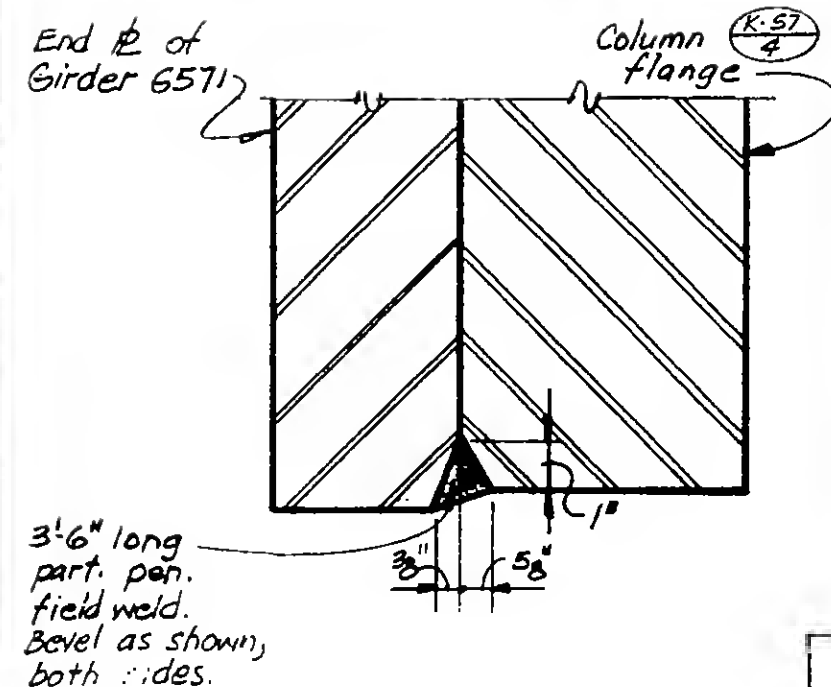
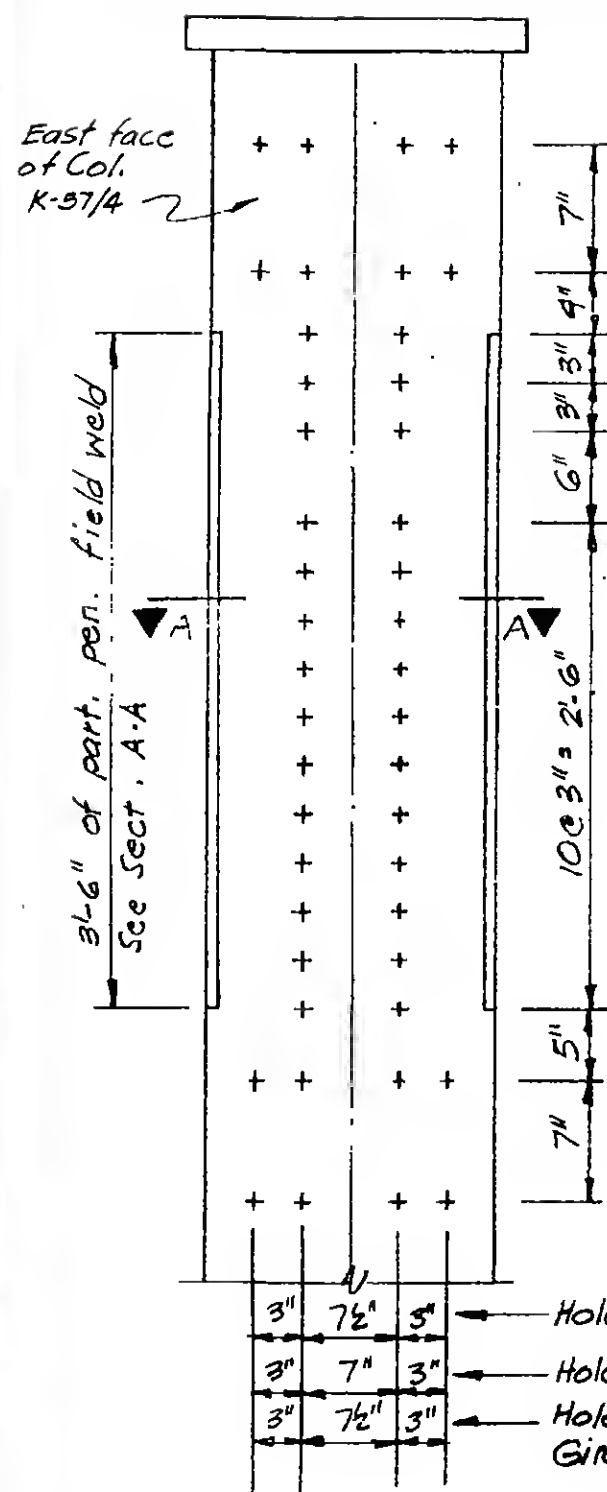
DATE

1-9-74

REVISIONS

Procedure for repair of non-matching gauge distances, West end of R girder (G571) to east flange of column (K-57/4)

1. Install $\frac{3}{8}$ " drift pins to position center-line of girder to align with center-line of column
2. Chase ream holes to $1\frac{1}{8}$ ".
3. Install all bolts (use A490F in lieu of A490-X) using one only XH9 washer under bolt head and nut and tighten.
4. Preheat to 300° minimum temperature areas shown on this drawing (i.e. areas to be welded with partial penetration weld.)
5. Using arc-air gouge, remove metal to depth and configuration as shown on this drawing. IMPORTANT NOTE - CARE MUST BE TAKEN TO ASSURE THAT BEVEL IS TO DEPTH SHOWN AND NO GREATER.
6. Maintain preheat and interpass temperature at 225° minimum and weld using E70XX low hydrogen electrodes.
7. Weld on each side of the joint should be made prior to completion of day's work.
8. Care must be taken to allow for slow cooling of weld metal (i.e. cover with asbestos blanket, etc.)



DESIGNED

AR

DRAWN

M. J. Robertson

REVIEWED

JTM

19-K-1082

PROJECT

THE WORLD TRADE CENTER

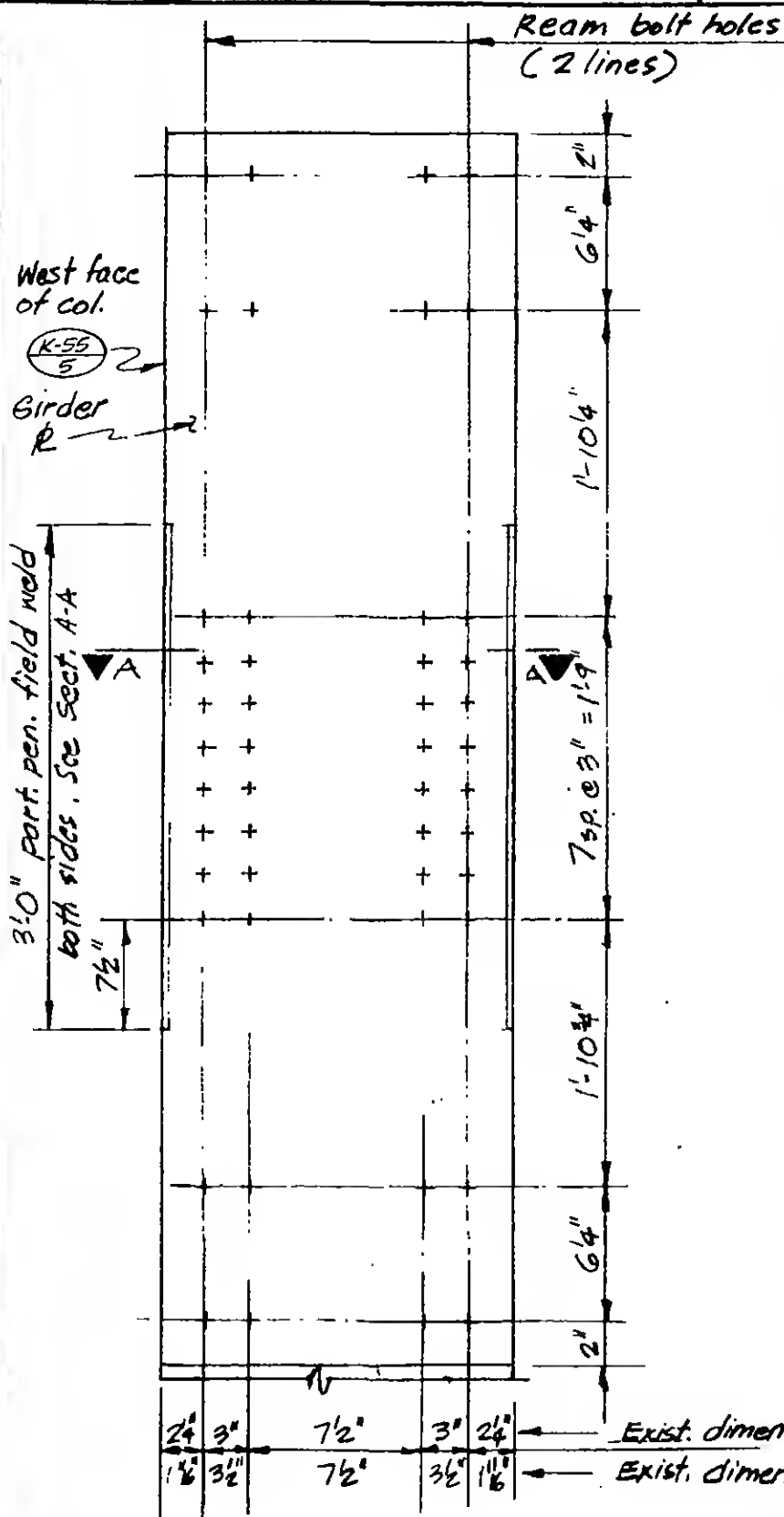
TITLE

EL. 332, ZONE K-5, REPAIR AT WEST FACE OF COL. (K-55/5)

DATE

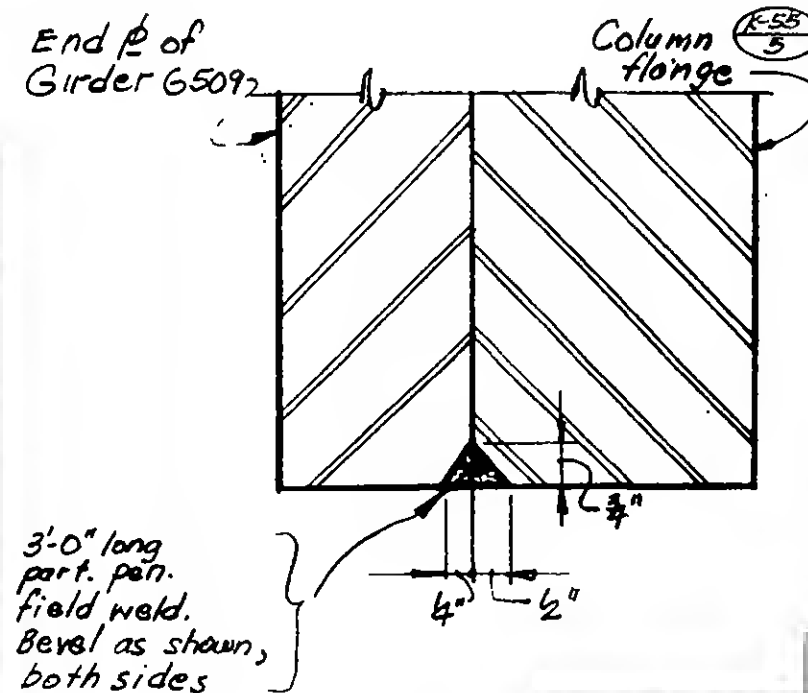
1-9-74

REVISIONS



Procedure for repair of non-matching gauge distances, East end of # girder (G509) to west flange of column (K-55/5)

1. Install A490-X bolts in all "fair" holes (i.e. install all bolts that will "make"). Tighten bolts.
2. Chase ream remaining holes to 1/8".
3. Install all remaining bolts (in reamed holes) using A490-F in lieu of A490-X & one XH9 washer under bolt head and nut and tighten.
4. Preheat to 300° minimum temperature areas shown on this drawing (i.e. areas to be welded with partial penetration field weld.)
5. Using arc-air gouge remove metal to depth and configuration as shown on this drawing.
IMPORTANT NOTE - CARE MUST BE TAKEN TO ASSURE THAT BEVEL IS TO DEPTH SHOWN AND NO GREATER.
6. Maintain preheat and interpass temperature at 225° minimum and weld using E70XX low hydrogen electrodes.
7. Weld on each side of the joint should be made prior to completion of days work.
8. Care must be taken to allow for slow cooling of weld metal (i.e. cover with asbestos blanket, etc.)



Refer to 13-K2.4-14C for details not shown on this sheet.



DESIGNED

AK

DRAWN

JTM

REVIEWED

JTM

19-K-1083

SKILLING, HELLE, CHRISTIANSEN, ROBERTSON

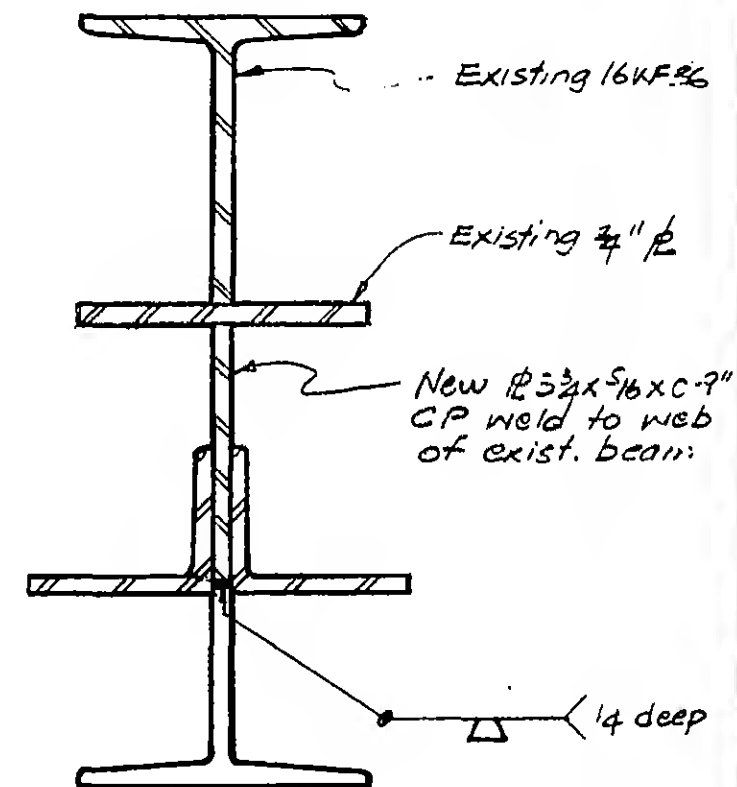
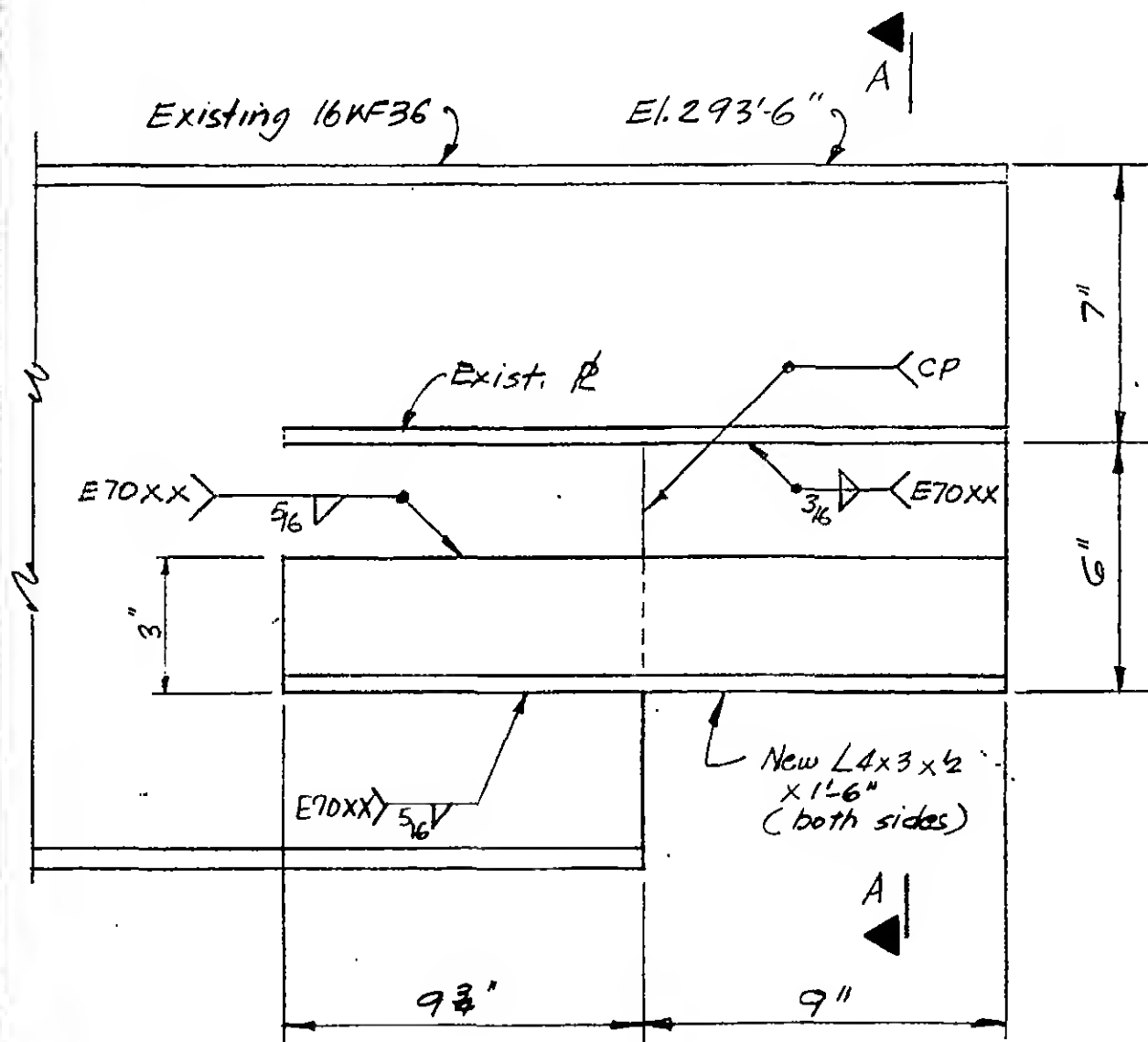
Structural & Civil Engineers

PROJECT THE WORLD TRADE CENTER

TITLE EL. 294, ZONE K-5, REPAIR AT BEAM NEAR COL.

DATE 1-9-74

REVISIONS



DESIGNED AR

DRAWN pmdali

REVIEWED JTM

Refer to Levinson Shop Drawing #V3302

ELEVATION - NORTH END - BEAM B7D14

A

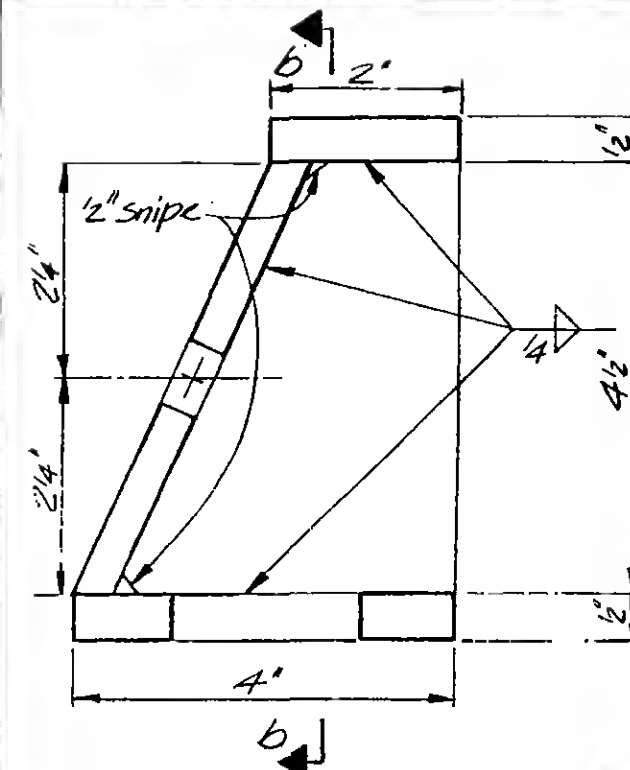
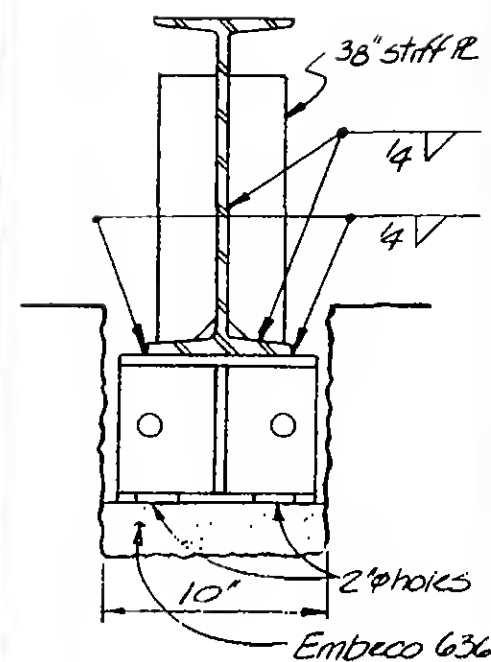
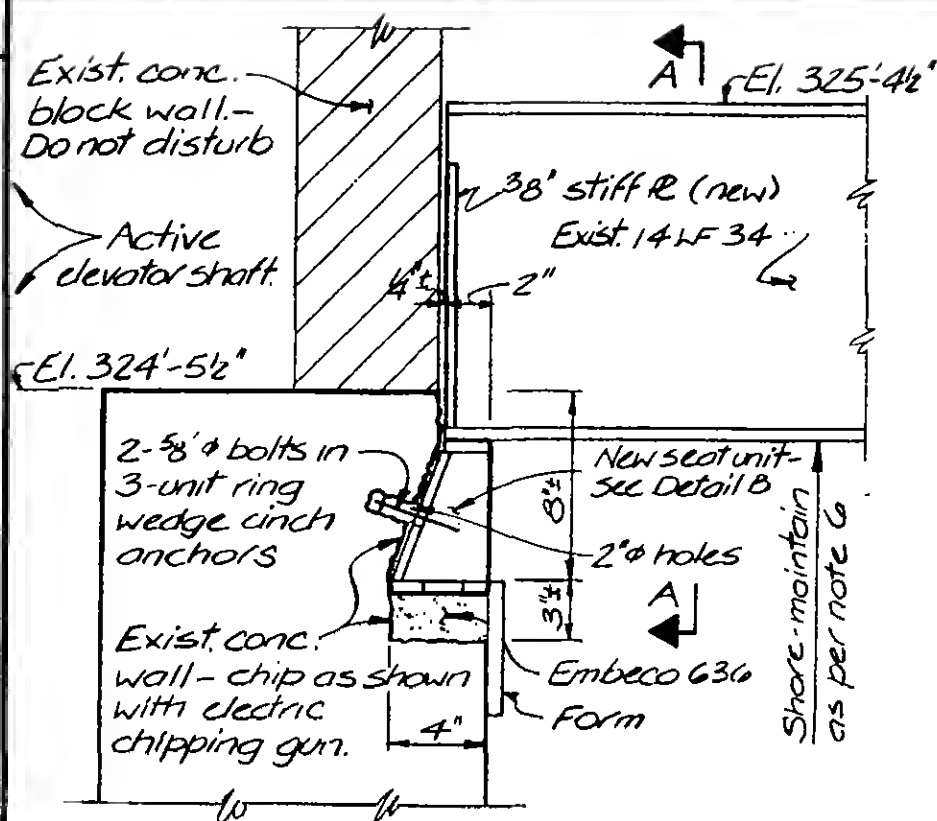
19-K-1084

PROJECT THE WORLD TRADE CENTER

TITLE REPAIR DETAIL FOR MISLOCATED HANGER
EL 332, ZONE K-3, 4'-6" NORTH OF COL. (K-51)

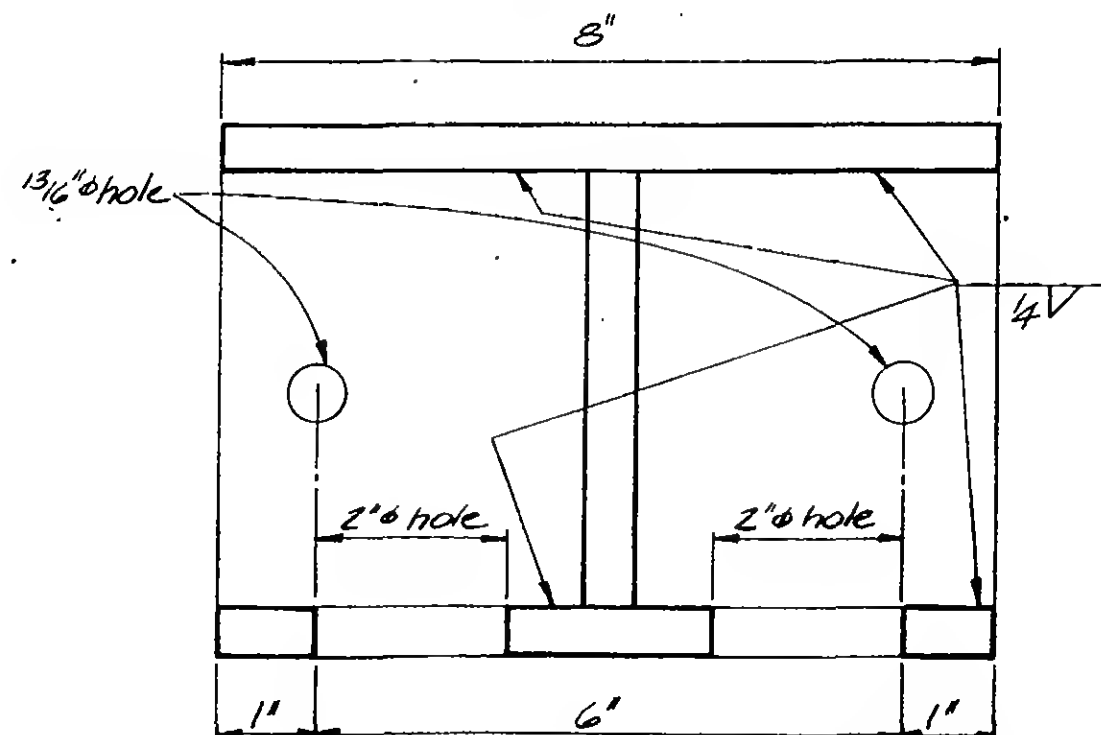
DATE 1-29-74

REVISIONS



After seat unit has been welded to bottom flanges of the 14 WF 34 -

1. Place form.
2. Pour flowable mix of Embeco 636 thru 2" ϕ holes in bottom plate of seat unit.
3. Rod Embeco thoroughly to insure firm bearing.
4. Insert 2-5/8" ϕ bolts through 13/16" ϕ holes in back plate into cinch anchors and hand tighten. (Note: Holes for cinch anchors can be drilled prior to welding seat unit to bottom flange of beam. Seat unit can be used as a template to locate holes to be drilled.)
5. Fill space between chipped existing concrete wall and back plate of seat unit with Embeco 636. (Tamp sides to prevent flowing out.)
6. Allow to set for 48 hours before removing shoring from under existing 14 WF 34.
7. Cut off existing mislocated hanger 1" below bottom flange of existing 30 WF 116



All plates to be 1/2" thick ASTM-A36

DESIGNED
L.E.L., A.R., J.T.M.,DRAWN
J.B.

REVIEWED

19-K-1085

PROJECT THE WORLD TRADE CENTER

TITLE REPAIR DETAIL AT TOP OF 14WF202 DIAGONALS, PL. 352,
ZONE K-3, WEST OF COLUMNS K-45/2 & K-47/2

DATE 1-31-74

REVISIONS

Refer to 13-K5.3-1.1
for Working Points
and Working Lines.
All working points
and working lines to
be maintained as
shown.

Exist. 60"x18"
girder

Exist. 48"x16"
girder

Exist. 2" PL

Exist. 14WF202

SEQUENCE OF WORK

1. Remove 2" PL from 14WF202 by carbon arc gouging existing fillet weld.
2. Bolt 2" plate to bottom flange of 48"x16" PL as shown on 13-K5.3-1.1.
3. Single bevel web and flanges of 14WF202.
4. Complete penetration weld 14WF202 to 2" plate.
5. Maintain all working points and worklines as shown on 13-K5.3-1.1.
6. This detail occurs at two locations - west of columns $\frac{K-45}{2}$ & $\frac{K-47}{2}$



DESIGNED

AR

DRAWN

JMB

REVIEWED

JTM

19-K-1086

PROJECT

THE WORLD TRADE CENTER

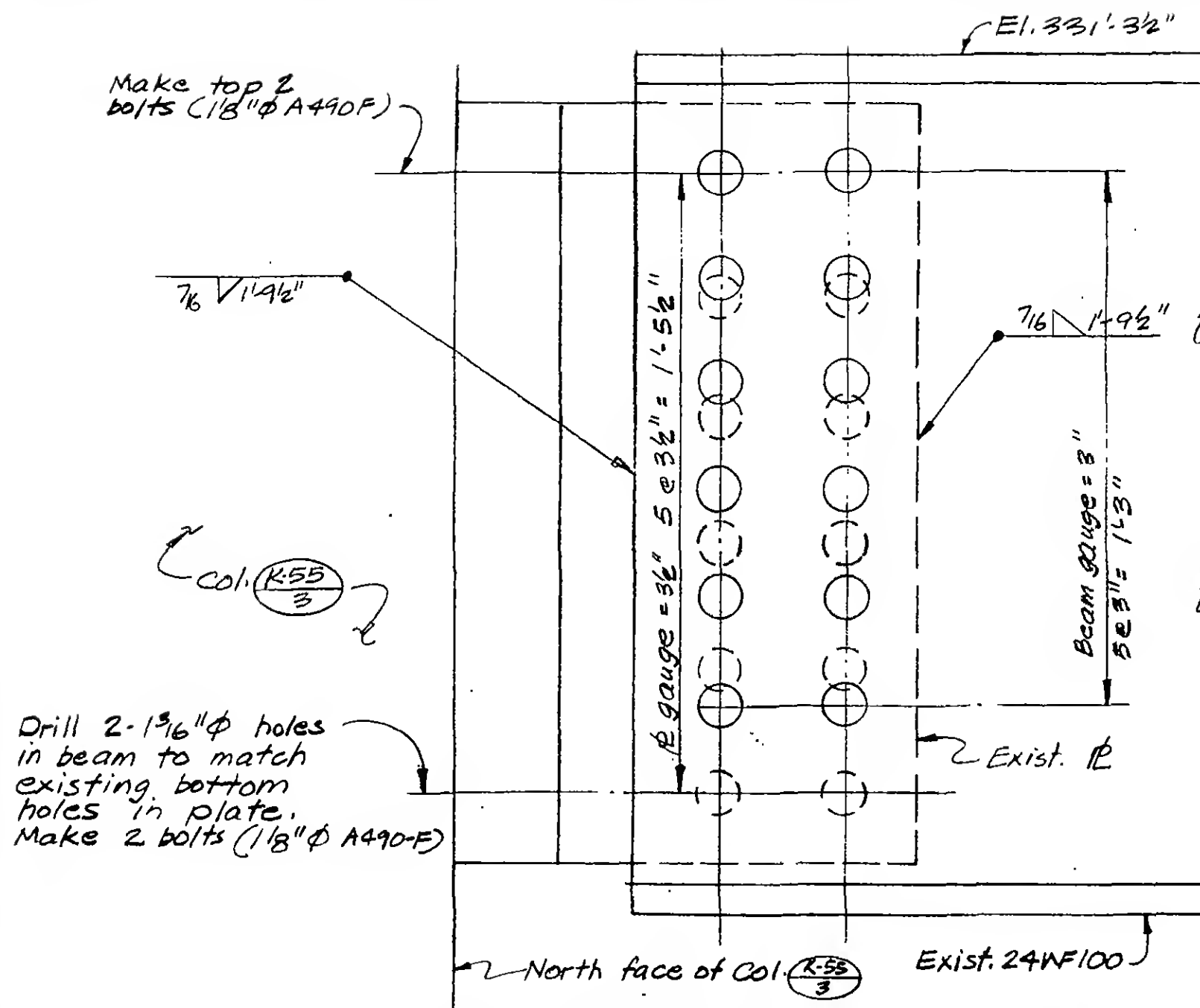
TITLE

REPAIR DETAIL AT SOUTH END OF 24WF100 EL. 332,
ZONE K-5 AT NORTH FACE OF COLUMN K-55/3

DATE

1-31-74

REVISIONS



NOTE: Make bolts (2 top and 2 bottom bolts before welding)



DESIGNED

AR

DRAWN

Michele

REVIEWED

JTM

19-K-1087

PROJECT

THE WORLD TRADE CENTER

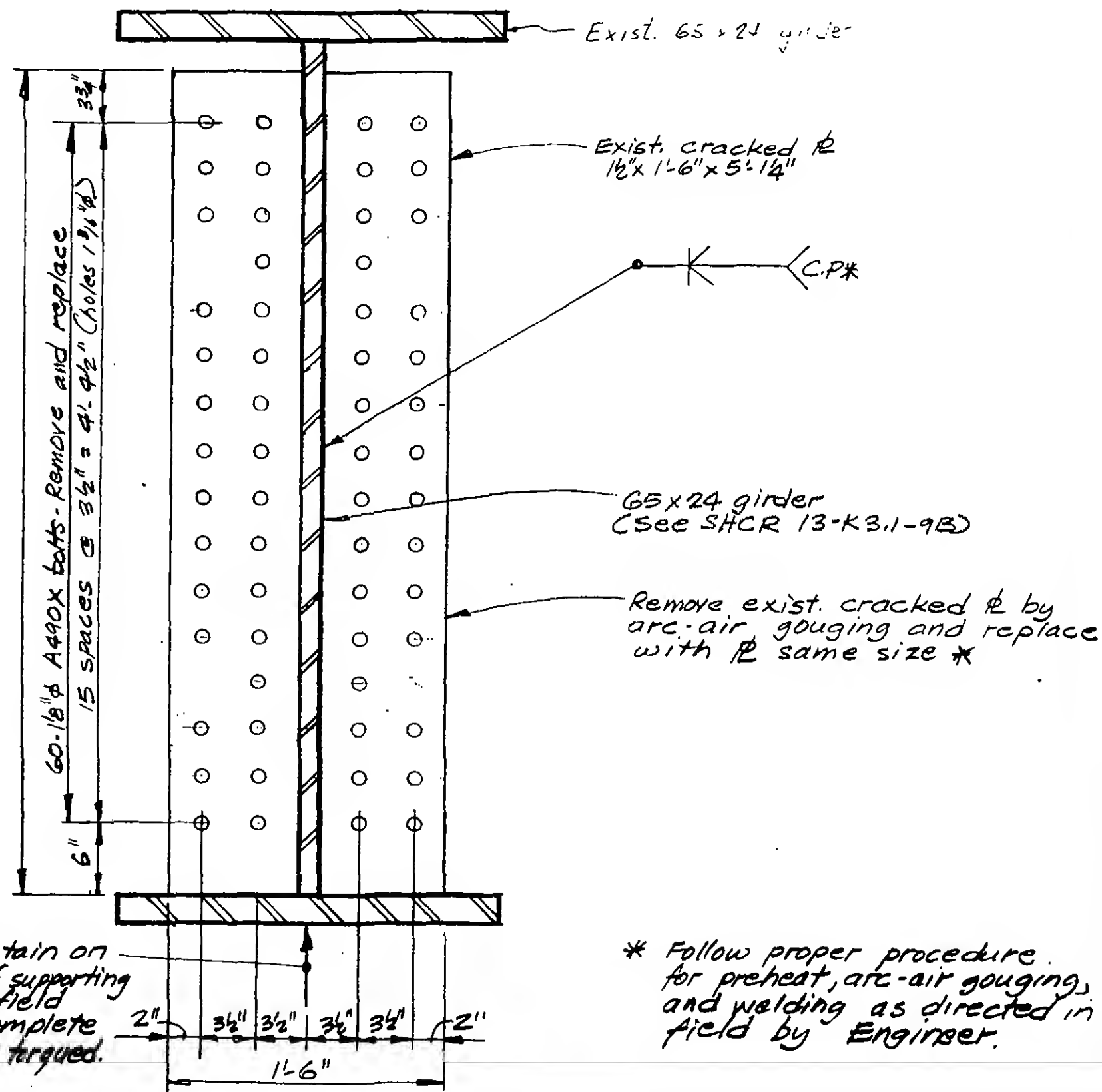
TITLE

REPAIR DETAIL AT CRACKED PLATE ON NORTH END OF 65x24"
GIRDER JUST NORTH OF COL. H-4/11, EL. 332, ZONE K-5

DATE

1-31-74

REVISIONS



* Follow proper procedure
for preheat, arc-air gouging,
and welding as directed in
field by Engineer.

SECTION LOOKING NORTH

19-K-1088



DESIGNED

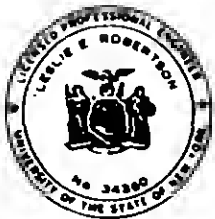
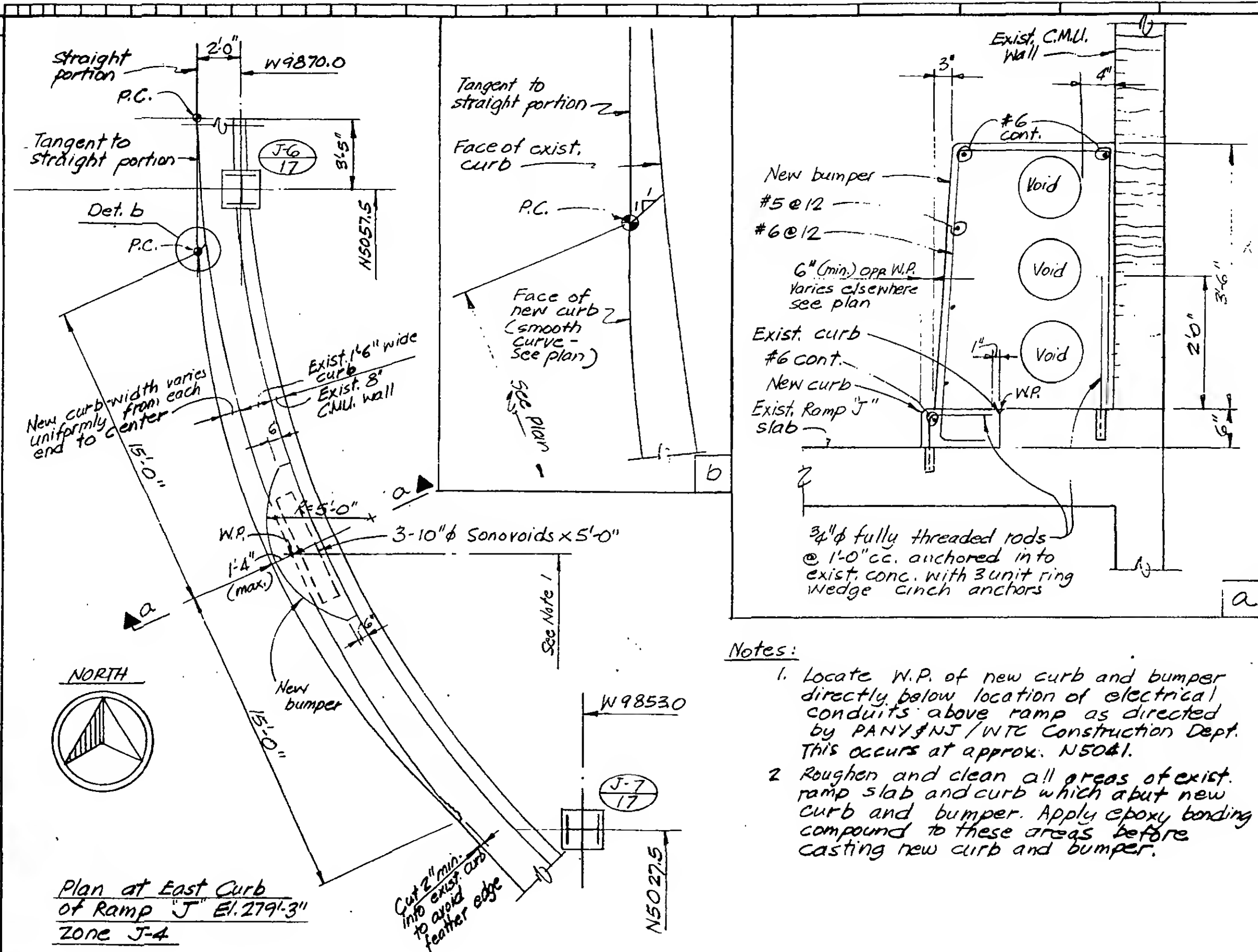
AR

DRAWN

M. J. J.

REVIEWED

JTM



DESIGNED JYM
DRAWN M. C. C.
REVIEWED WAT

PROJECT THE WORLD TRADE CENTER

TITLE NEW CURB AND BUMPER RAMP "J"

DATE 2-1-74

SKILLING, HELLE, CHRISTIANSEN, ROBERTSON

Structural & Civil Engineers

DWG. NO 19-J-1089

SKILLING, HELLE, CHRISTIANSEN, ROBERTSON

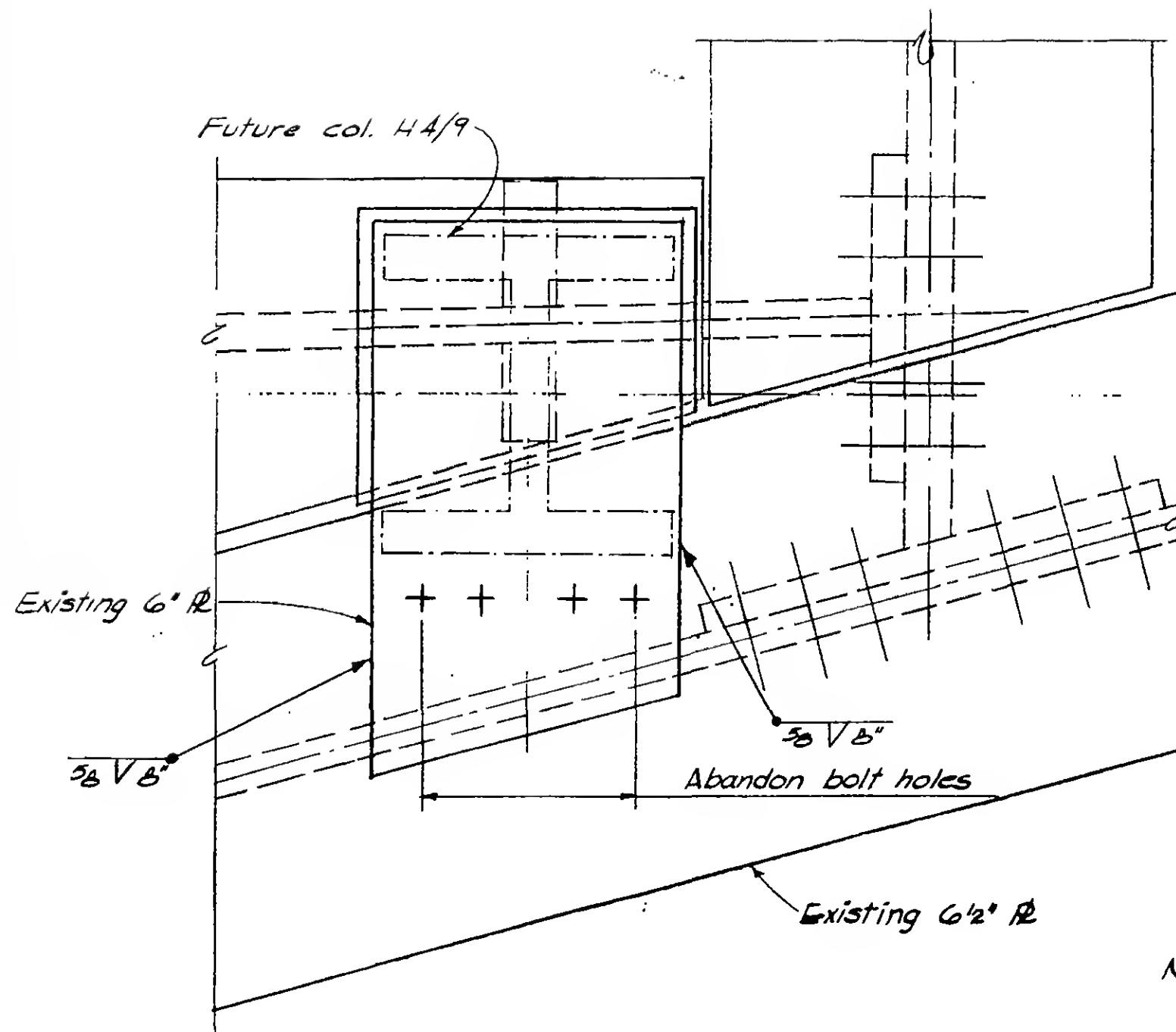
Structural & Civil Engineers

PROJECT THE WORLD TRADE CENTER

TITLE REPAIR DET., BASE R TO GIRDER CONN., COL. H4/9, EL. 332

DATE 2-28-74

REVISIONS



Note: For existing details
not shown see
Dwg. 13-K3.4-Ba

DESIGNED
ARDRAWN
DJBREVIEWED
JTM

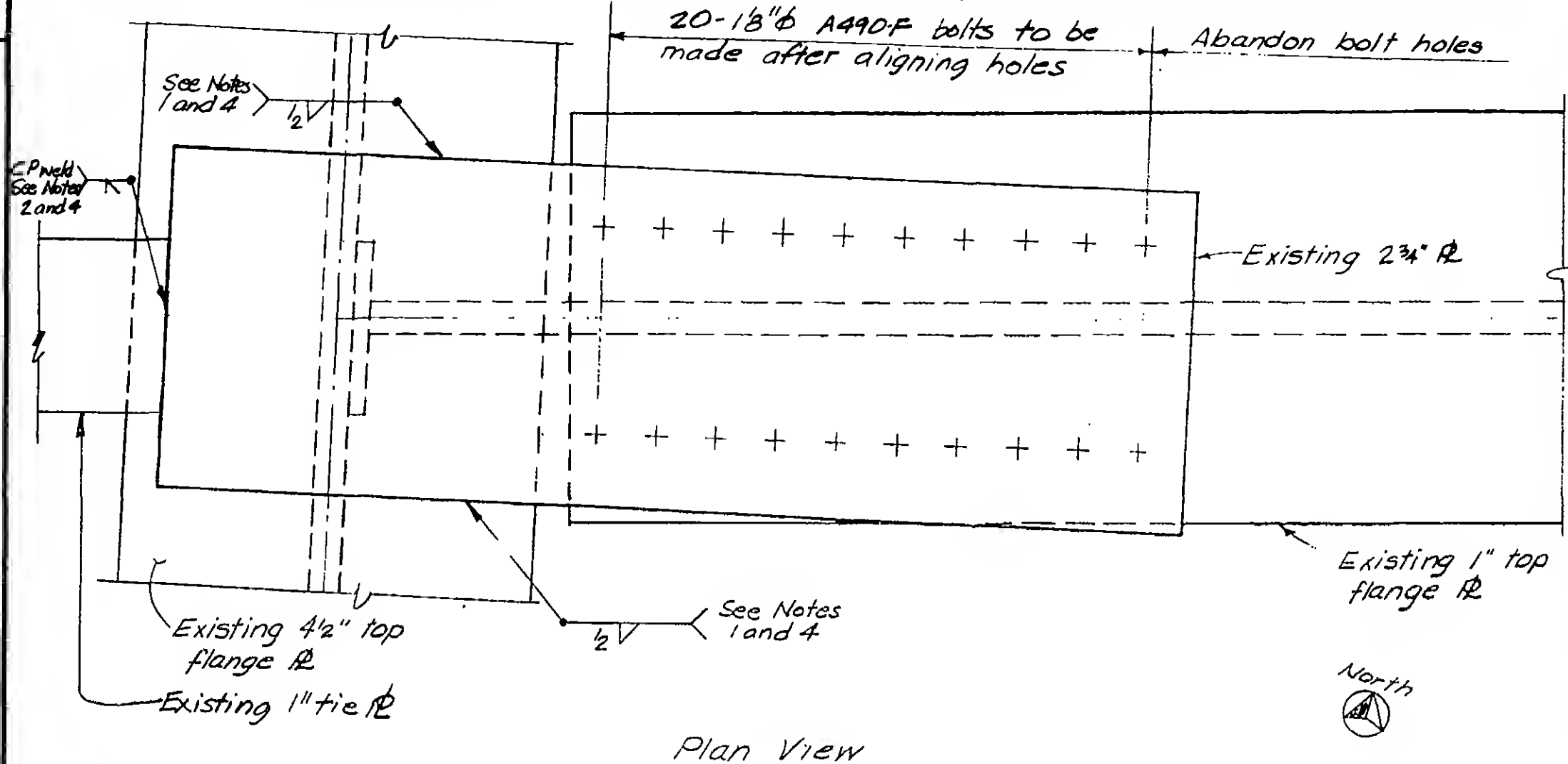
19-K-1090

PROJECT THE WORLD TRADE CENTER

TITLE ZONE K-3 EL 332 REPAIR DET. AT TOP FLANGE CONN. \varnothing BETWEEN
65x24 GIRDER AND 65/68x24 GIRDER AT COLUMN H5-9

DATE 2-28-74

REVISIONS



NOTES:

1. Remove 1/2" fillet weld on each side of 2 3/4" R.
2. Remove CP weld connecting 2 3/4" R to 1" R.
3. Position 2 3/4" R to make all 20-1 1/8" ϕ bolts. Do not remove the four 1/8" ϕ bolts made through 7" R.
4. Replace the 1/2" fillet welds on both sides of 2 3/4" R and the CP weld connecting 2 3/4" R to 1" R.

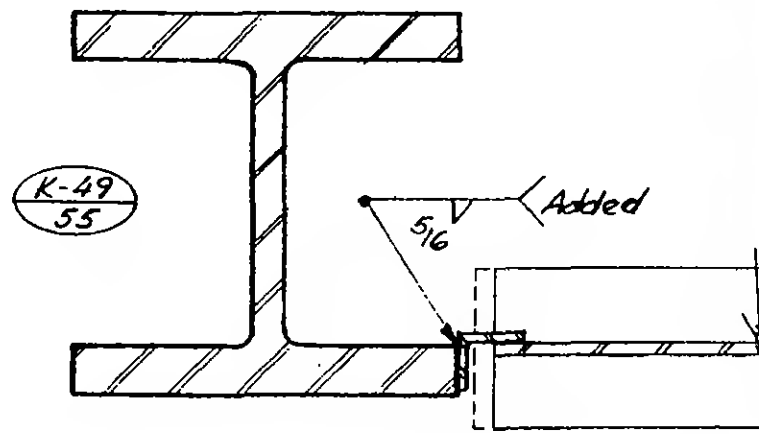
IMPORTANT: After repositioning 2 3/4" R, be sure that it seats against the finished portion of Girder G561 since a future column will be placed on it. After repositioning of 2 3/4" R, if complete seating (contact) is not obtained, notify ENGINEER

DESIGNED
ARDRAWN
DJBREVIEWED
JTM

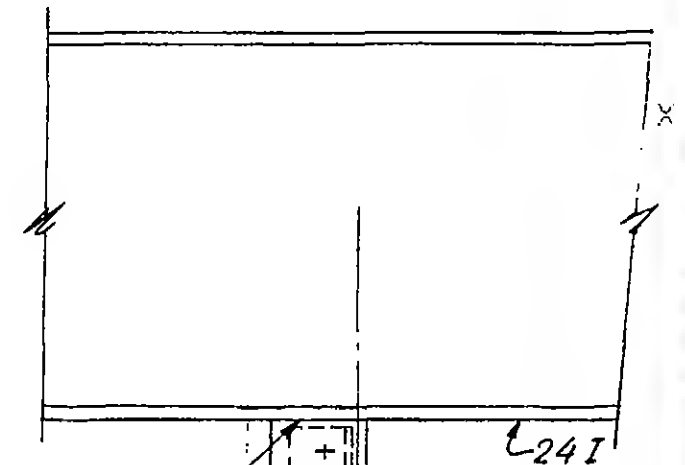
19-K-1091

REVISIONS

Reference: See Dwg. SK-106 Framing Plan
at Intermediate level.
Top of steel El. 320.0.

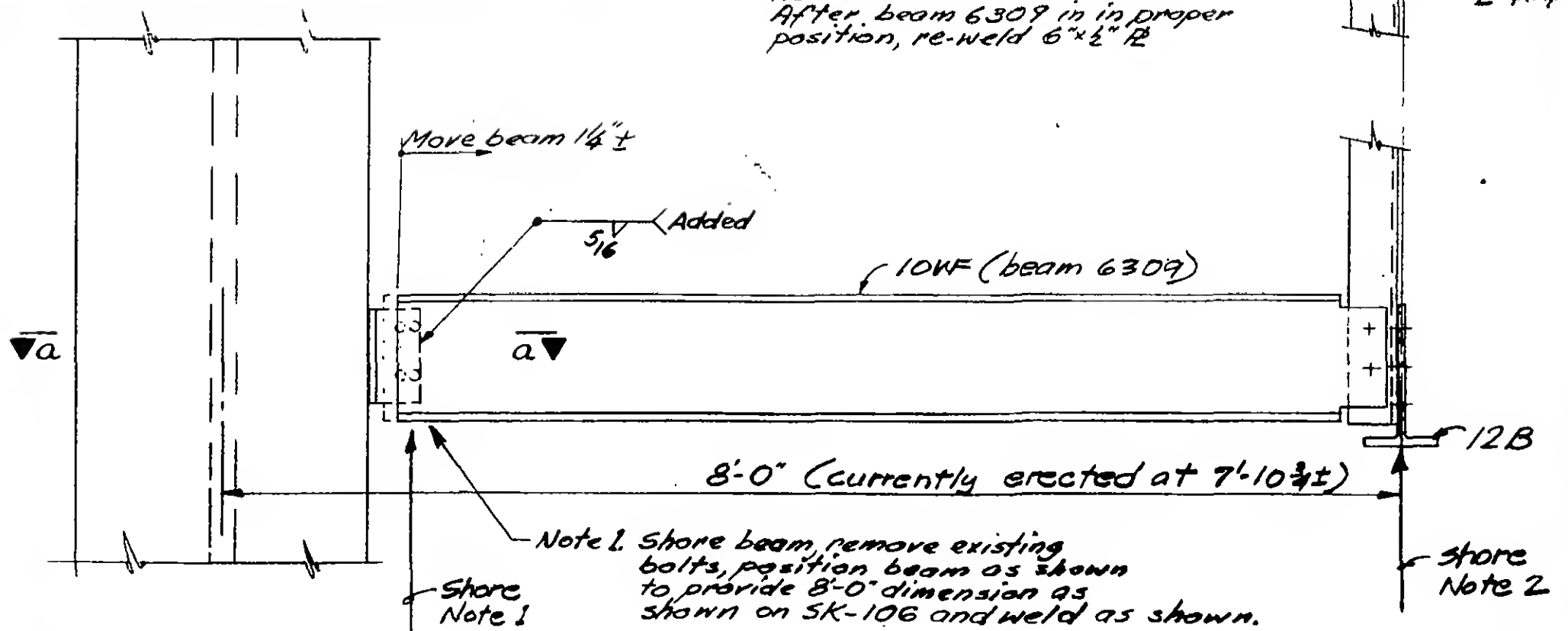


a



Note 2.
Shore beam, are an existing
double fillet weld of 6"x1/2" R

Note 3
After beam 6309 in in proper
position, re-weld 6"x1/2" R



Note 1. Shore beam, remove existing
bolts, position beam as shown
to provide 8'-0" dimension as
shown on SK-106 and weld as shown.

Shore
Note 2



DESIGNED

AR

DRAWN

J. Grigius

REVIEWED

WAB

19-K-1092

SKILLING, HELLE, CHRISTIANSEN, ROBERTSON

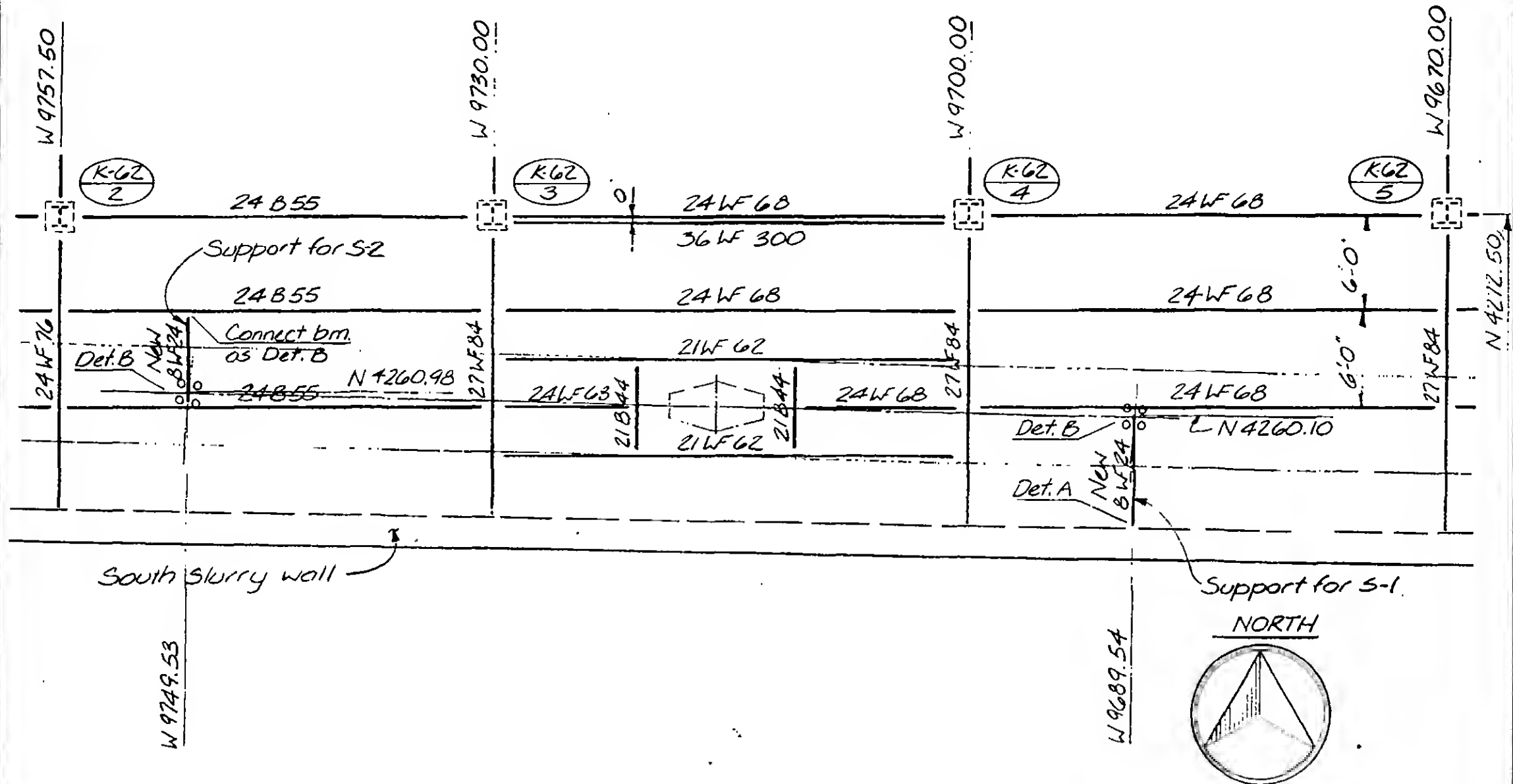
Structural & Civil Engineers

PROJECT THE WORLD TRADE CENTER

TITLE A.B. FOR LIGHT POSTS - STREET - ZONE K6

DATE 4-8-74

REVISIONS

DESIGNED
AR, W.A.B.DRAWN
J.B.REVIEWED
J.T.M.

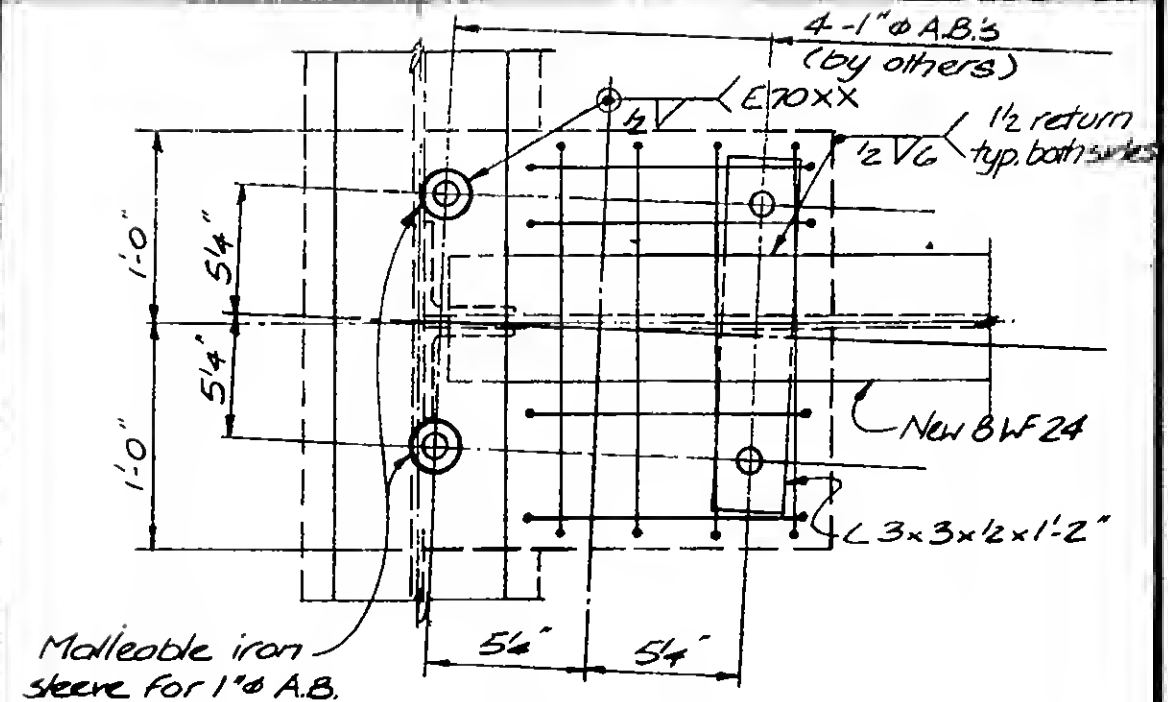
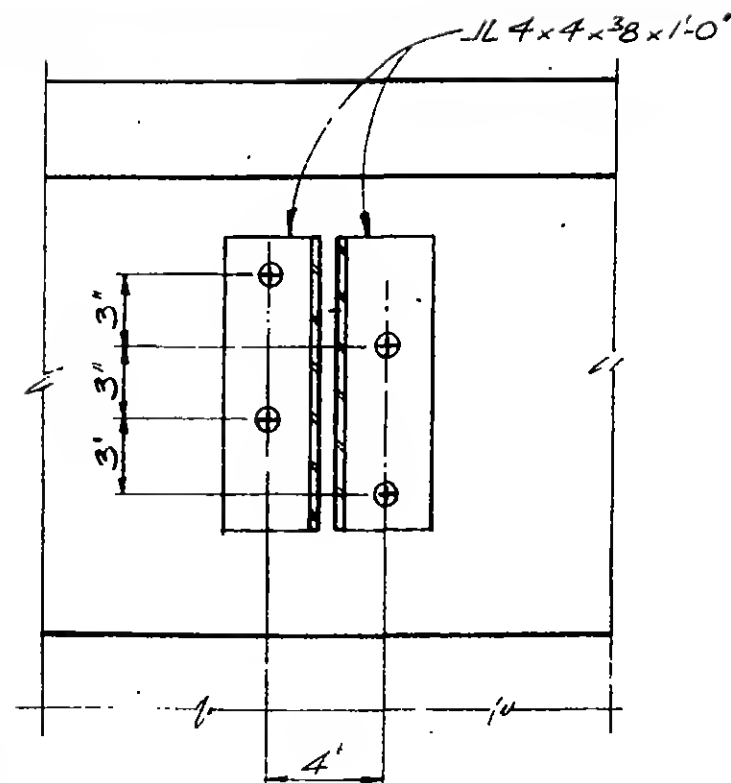
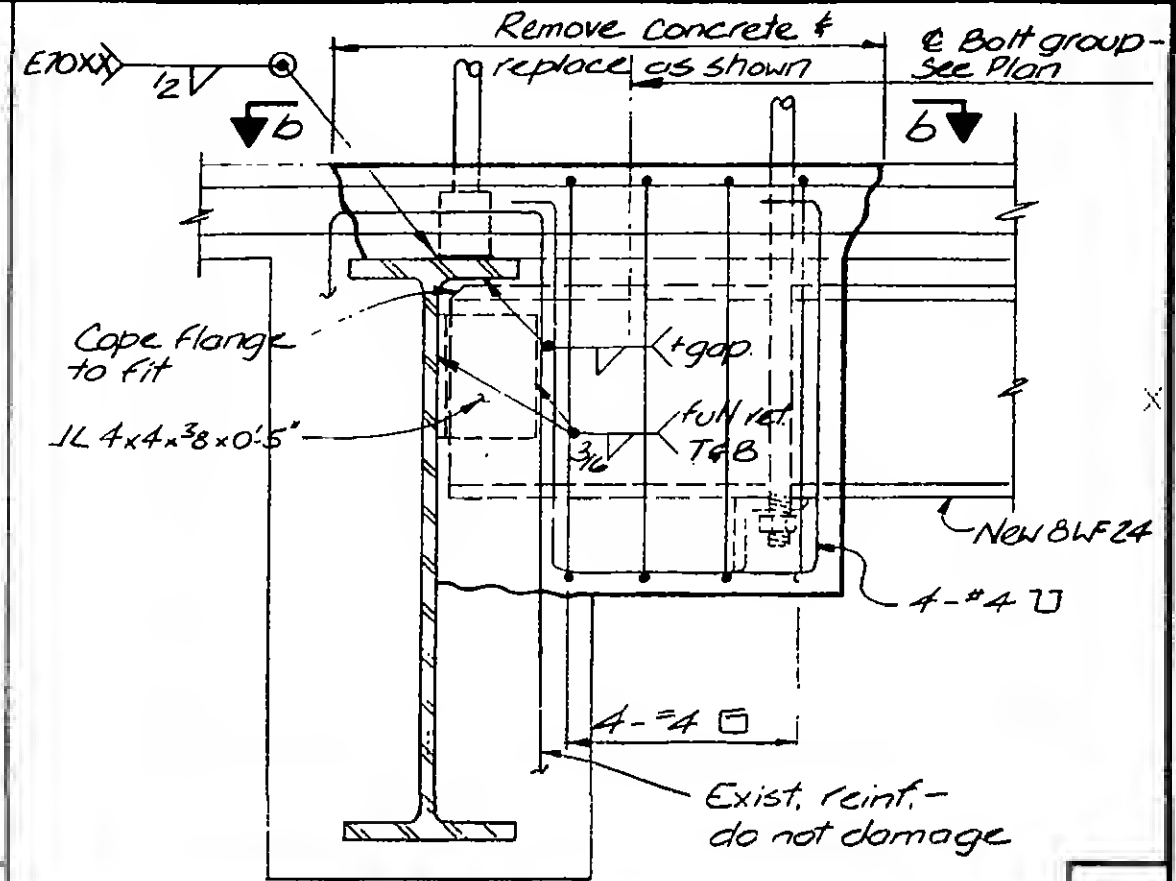
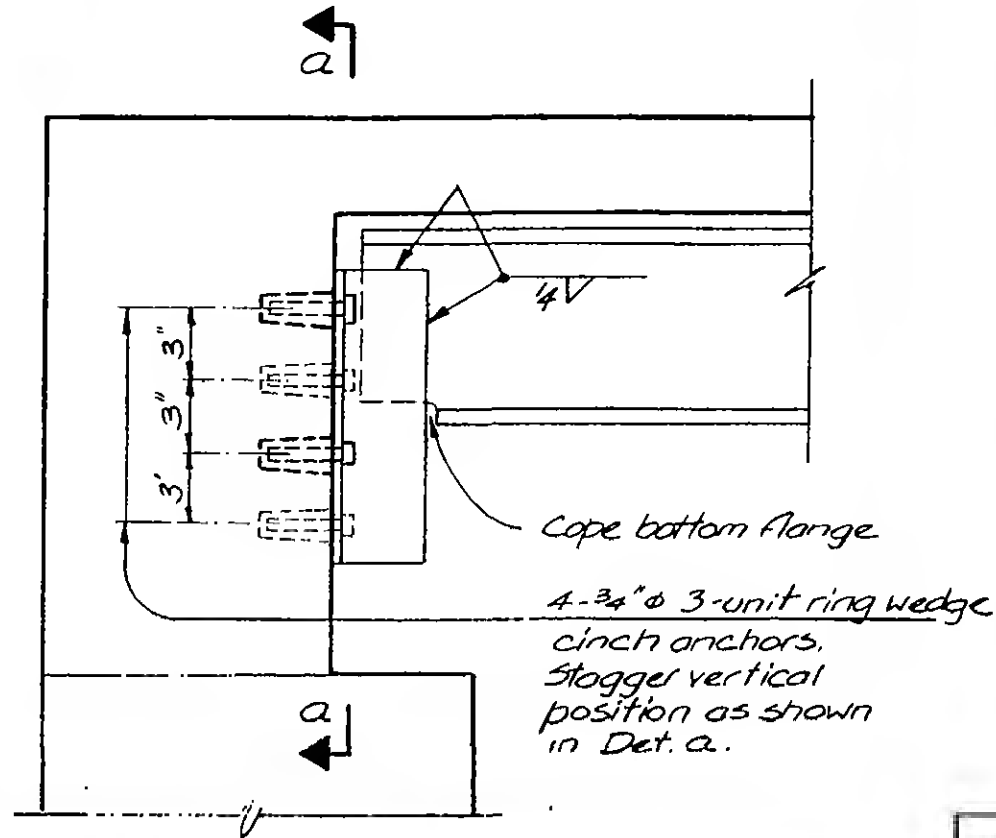
19-K-1093.1

PROJECT THE WORLD TRADE CENTER

TITLE A.B. FOR LIGHT POSTS - STREET - ZONE K6

DATE 4-8-74

REVISIONS



This Detail typ. at: 1. North end of support for S-1
2. South end of support for S-2



DESIGNED A.R., W.A.B.

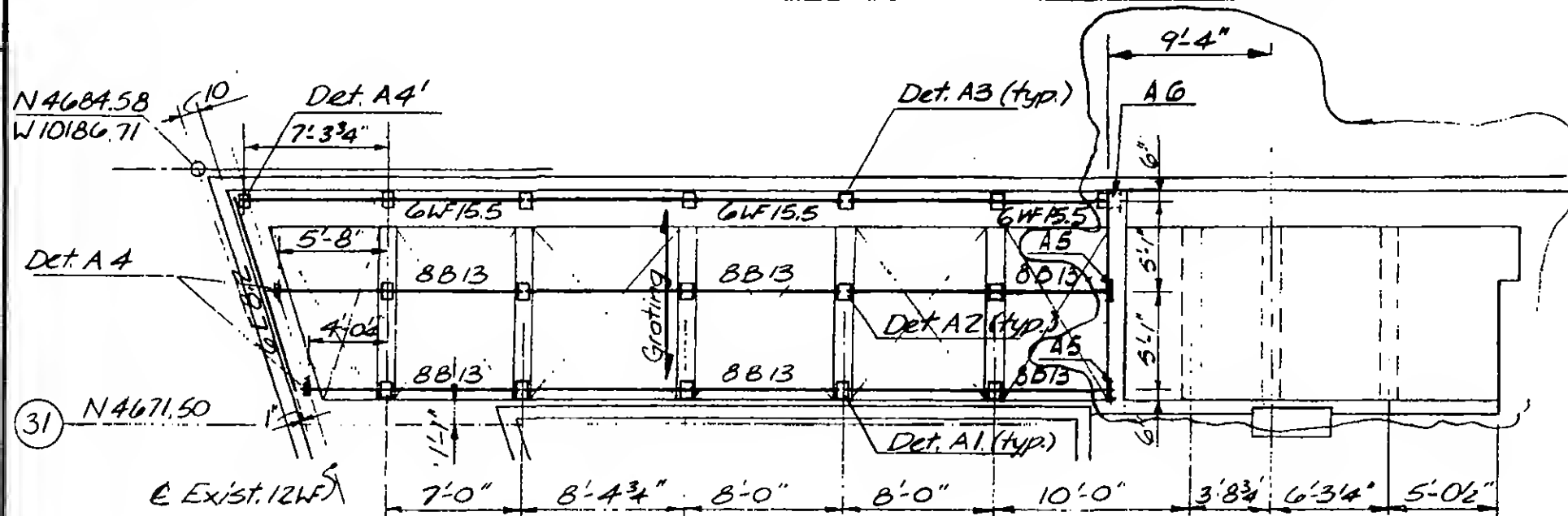
DRAWN J.B.

REVIEWED J.T.M.

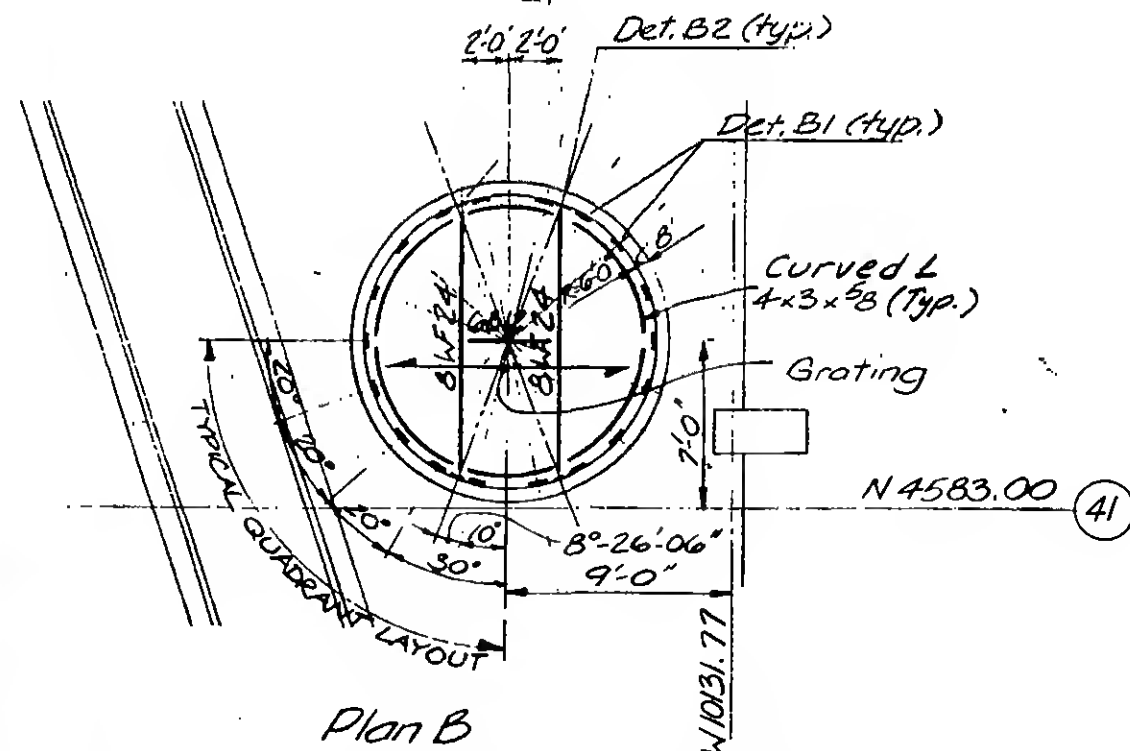
19-K-1093.2

REVISIONS

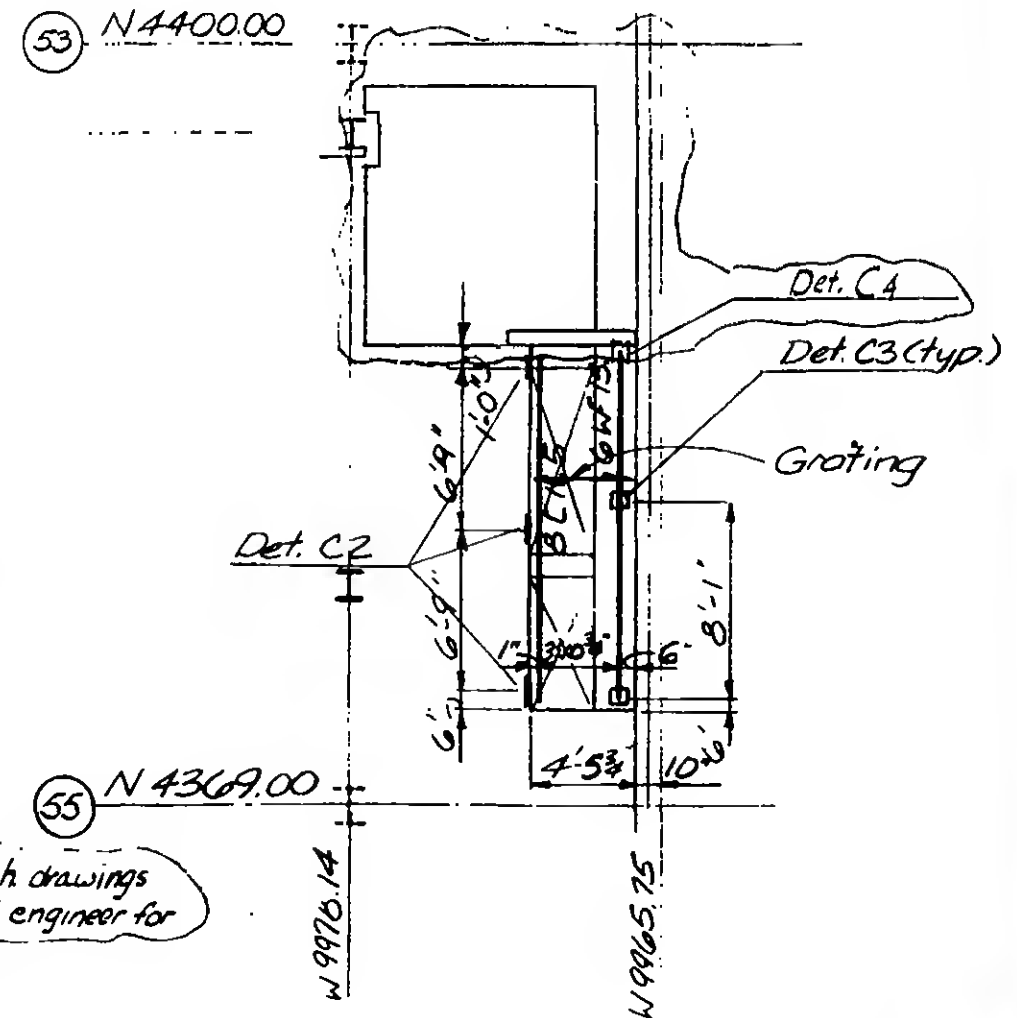
4-24-74
10-21-74



Plan A



Plan B



Plan C

- Notes 1. Provide grating at Plans A-B & C, spanning in the direction shown. See Arch. drawings for grating. Details of grating shall be submitted to Architect and engineer for approval.
2. All supporting steel shall be A36 with one shop coat of red primer.



DESIGNED *J.W.*

DRAWN *J.B*

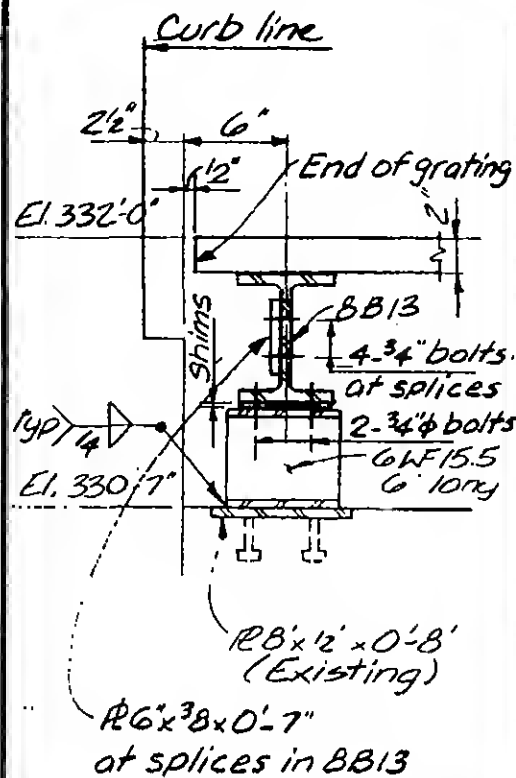
REVIEWED *J.T.M.*

19-K-1094.1

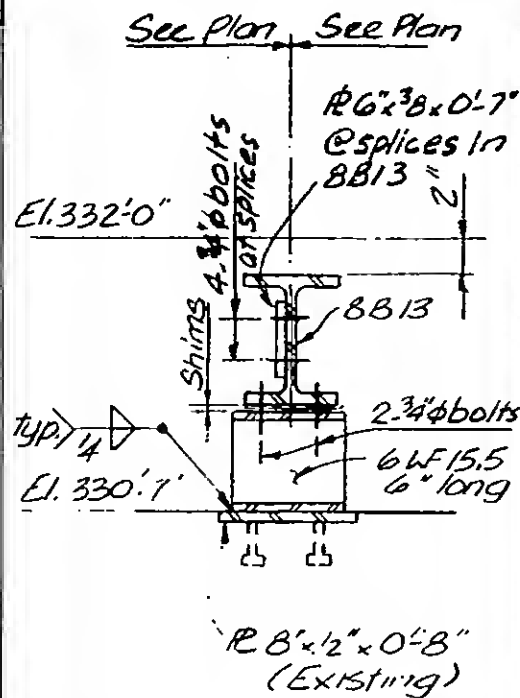
REVISIONS

4-24-74

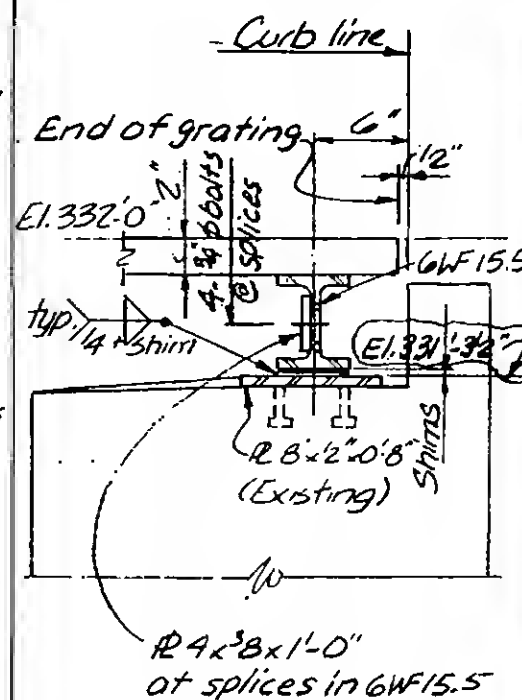
10-21-74



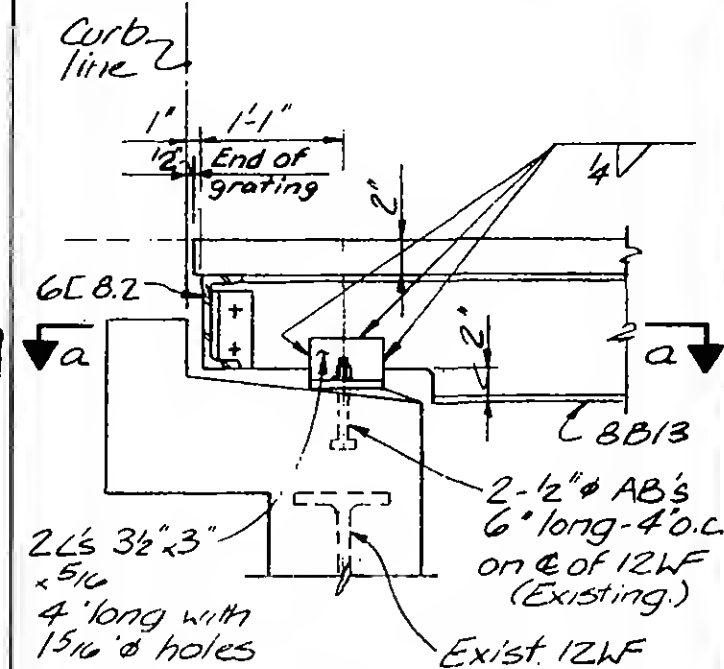
AI



AZ

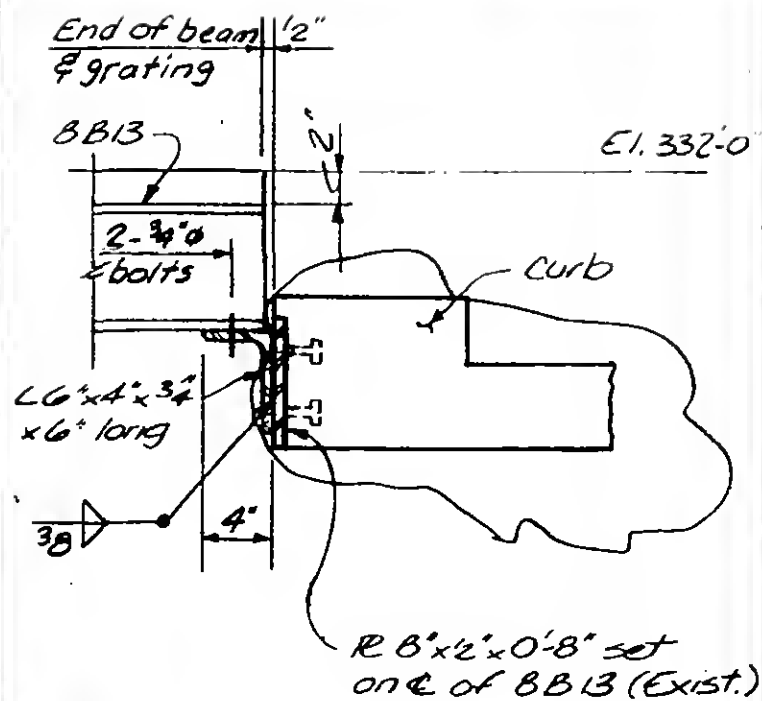


143

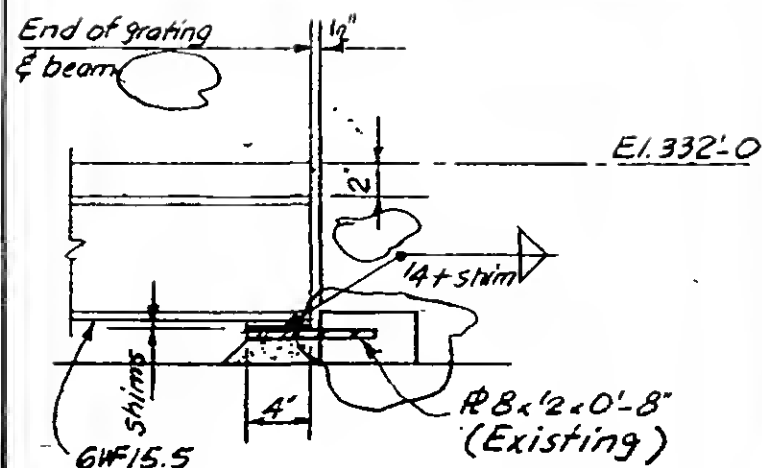


Note: Det. A4 'sim. to A4 except
use existing setting R in lieu of 2 L's
and anchor bolts.
Top of setting R: El. 331'-3 1/2"

| | |
|----|----|
| 44 | 44 |
|----|----|

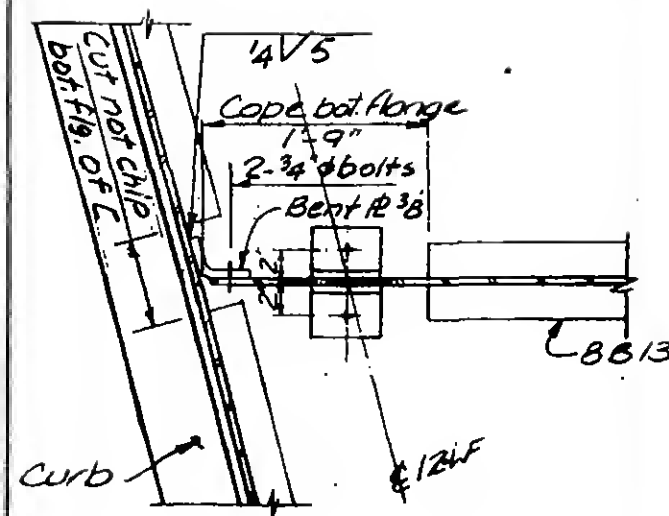


A5



AG

C4



Q

19-K-1094.2



DESIGNED

J.H.

DRAWN

1.6.

REVIEWED

J.T.M.

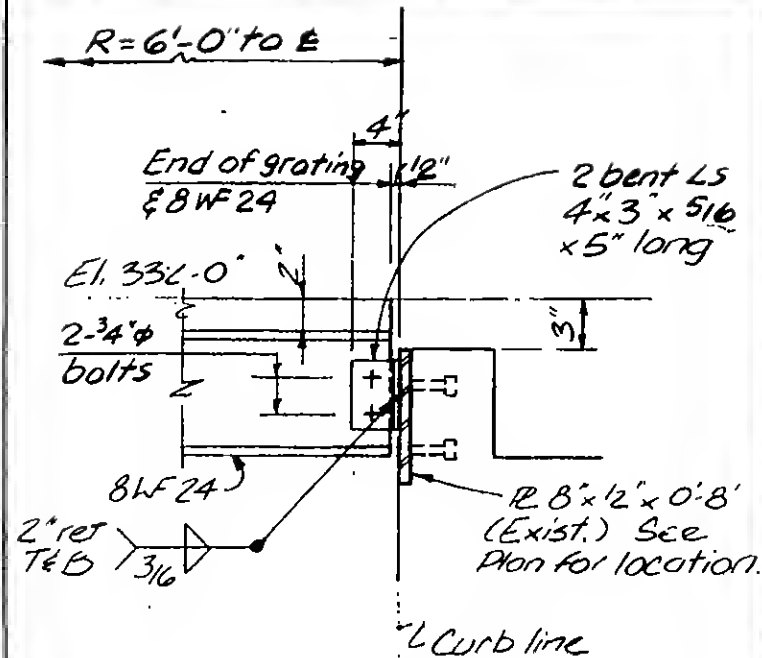
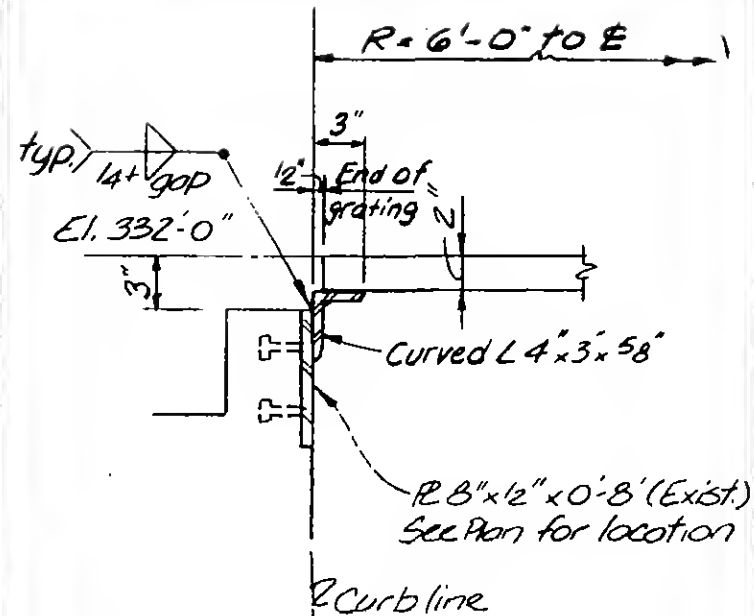
PROJECT THE WORLD TRADE CENTER

TITLE GRATING & SUPPORTS AT F.A.I. OPENINGS-EL.332

DATE 4-17-74

REVISIONS

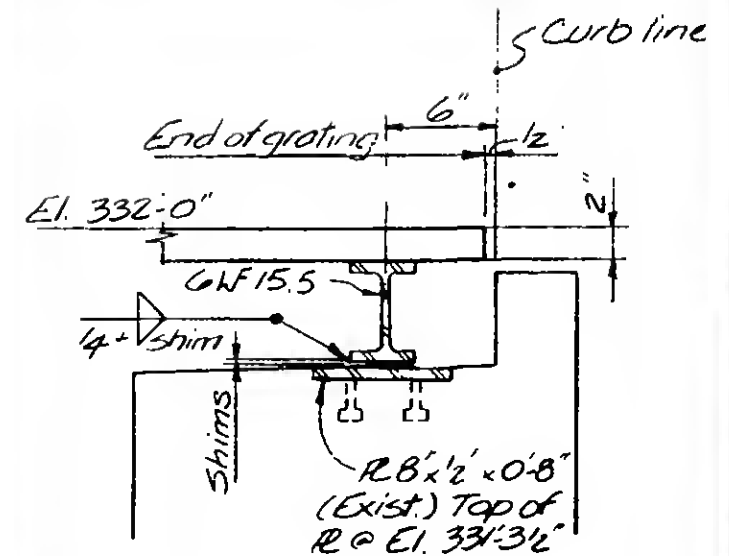
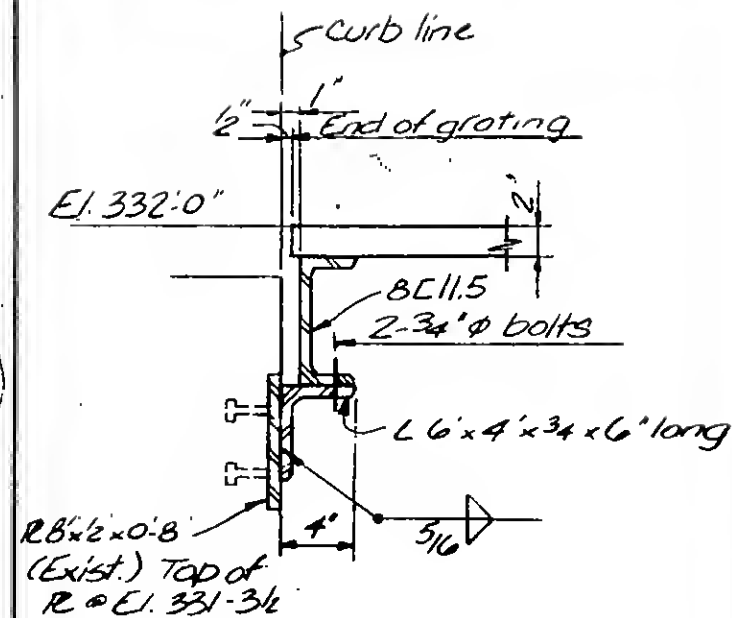
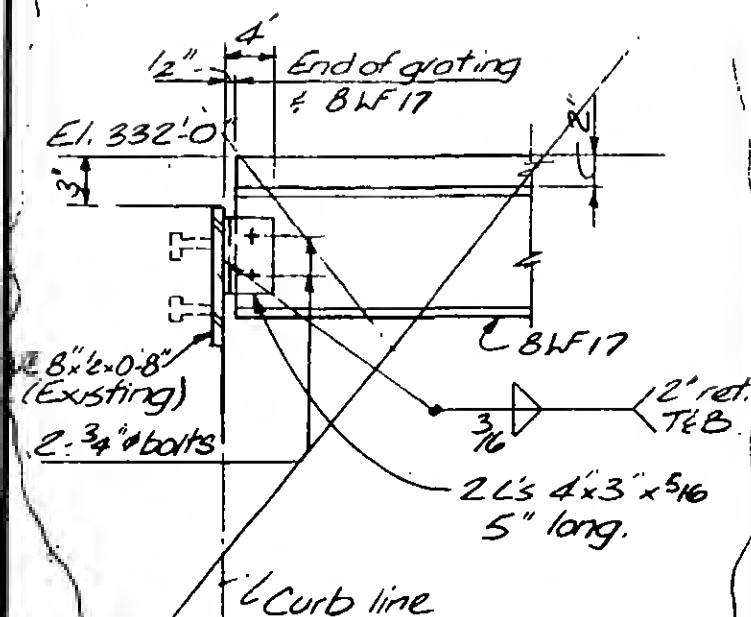
4-24-74
10-21-74



81

B2

VOLD



43

19-K-1094.3



DESIGNED
J.W.

DRAWN *J.B.*

REVIEWED *J.T.M.*

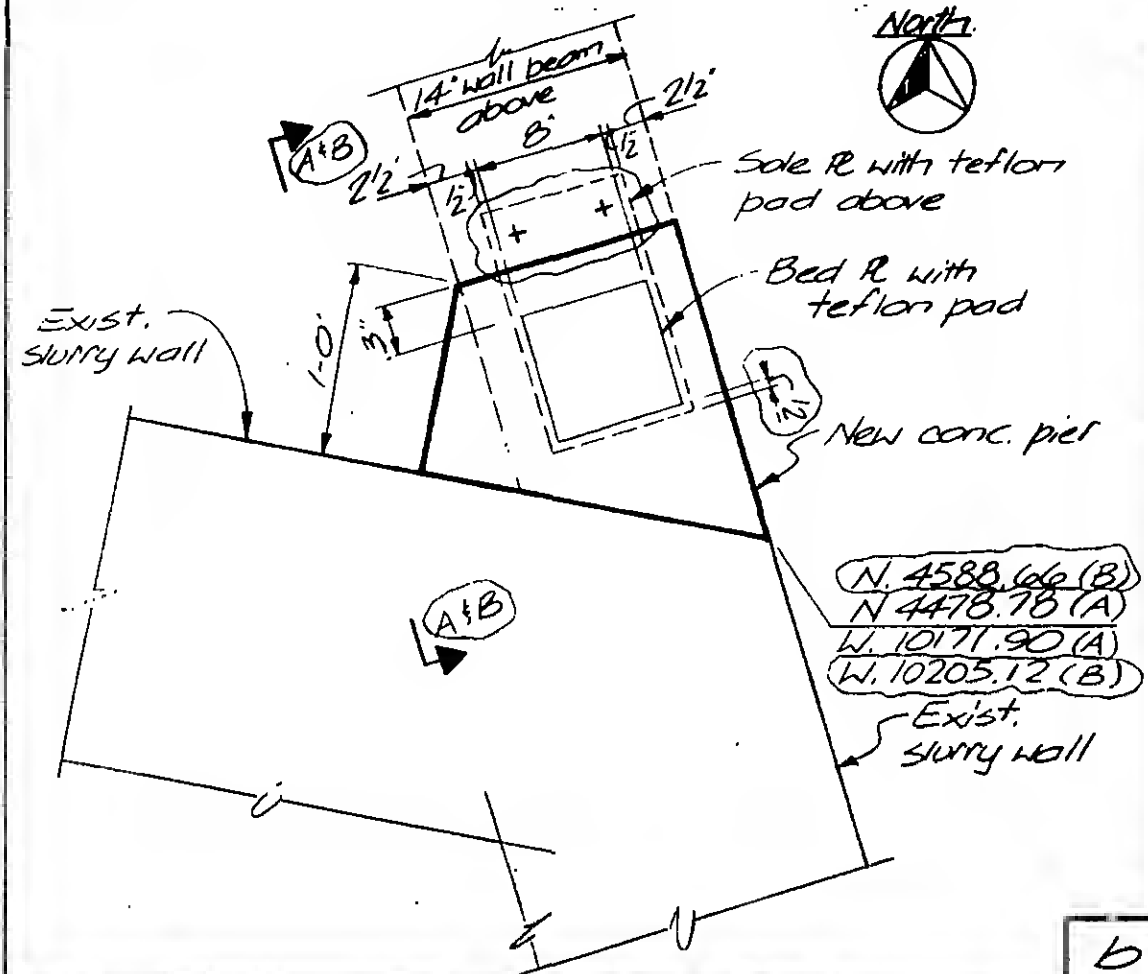
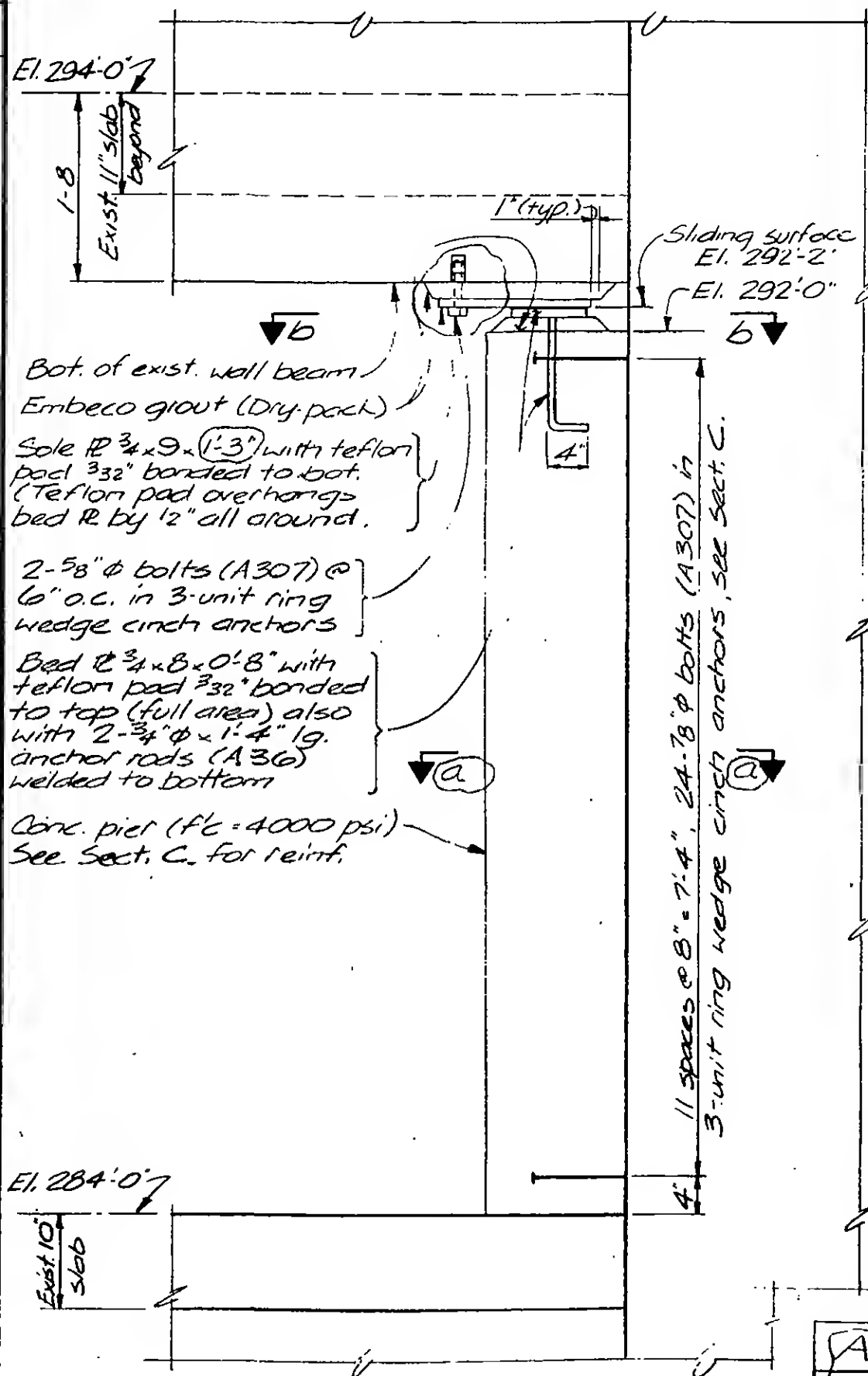
PROJECT THE WORLD TRADE CENTER

TITLE PLAZA - ZONE K-3 - EL 294 - REPAIR

DATE 4-4-75

REVISIONS

4-14-75



- Notes 1. All reinf. A615-60
2. Detail A shown, Detail B opp. hand.

Roughen and clean entire surface of exist. slurry wall at conc. pier and apply a coat of epoxy bonding compound just prior to casting conc. pier



DESIGNED JTM

DRAWN JB

REVIEWED ETL

19-K-1095

PROJECT

THE WORLD TRADE CENTER

TITLE

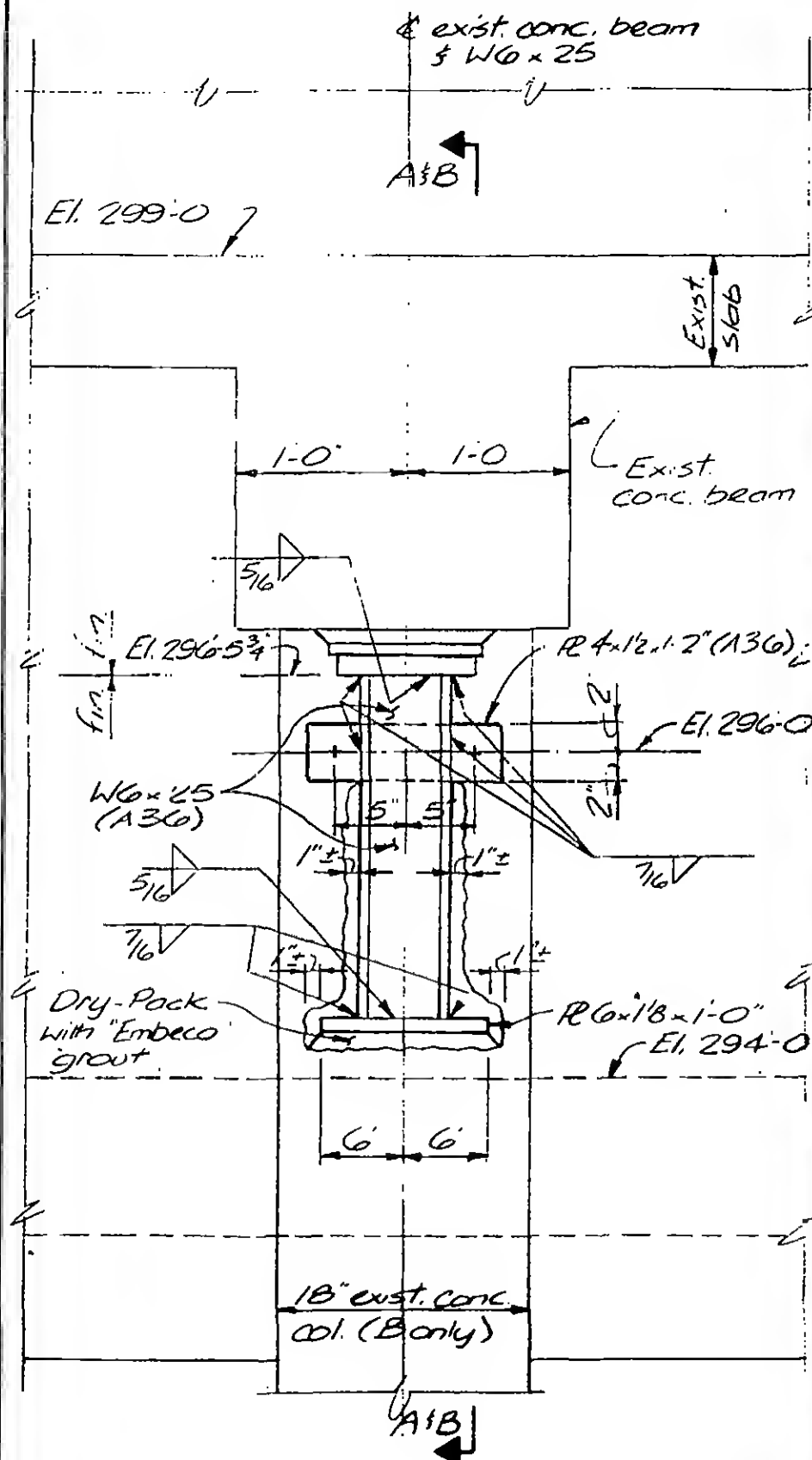
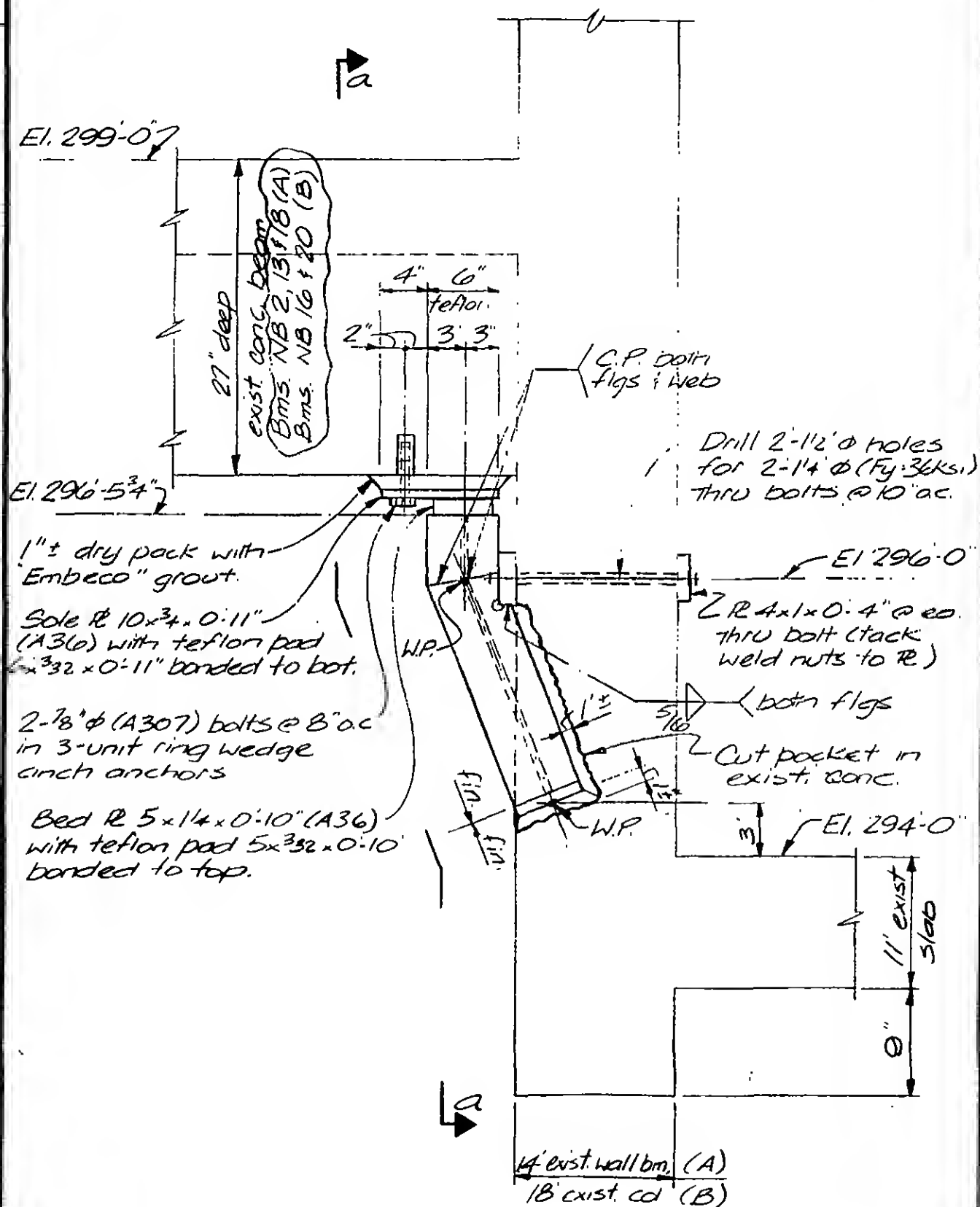
PLAZA-ZONE J-3 - EL. 299 - REPAIR

DATE

4-4-75

REVISIONS

4-14-75



DESIGNED JTM

DRAW JB

REVIEWED ETL

A

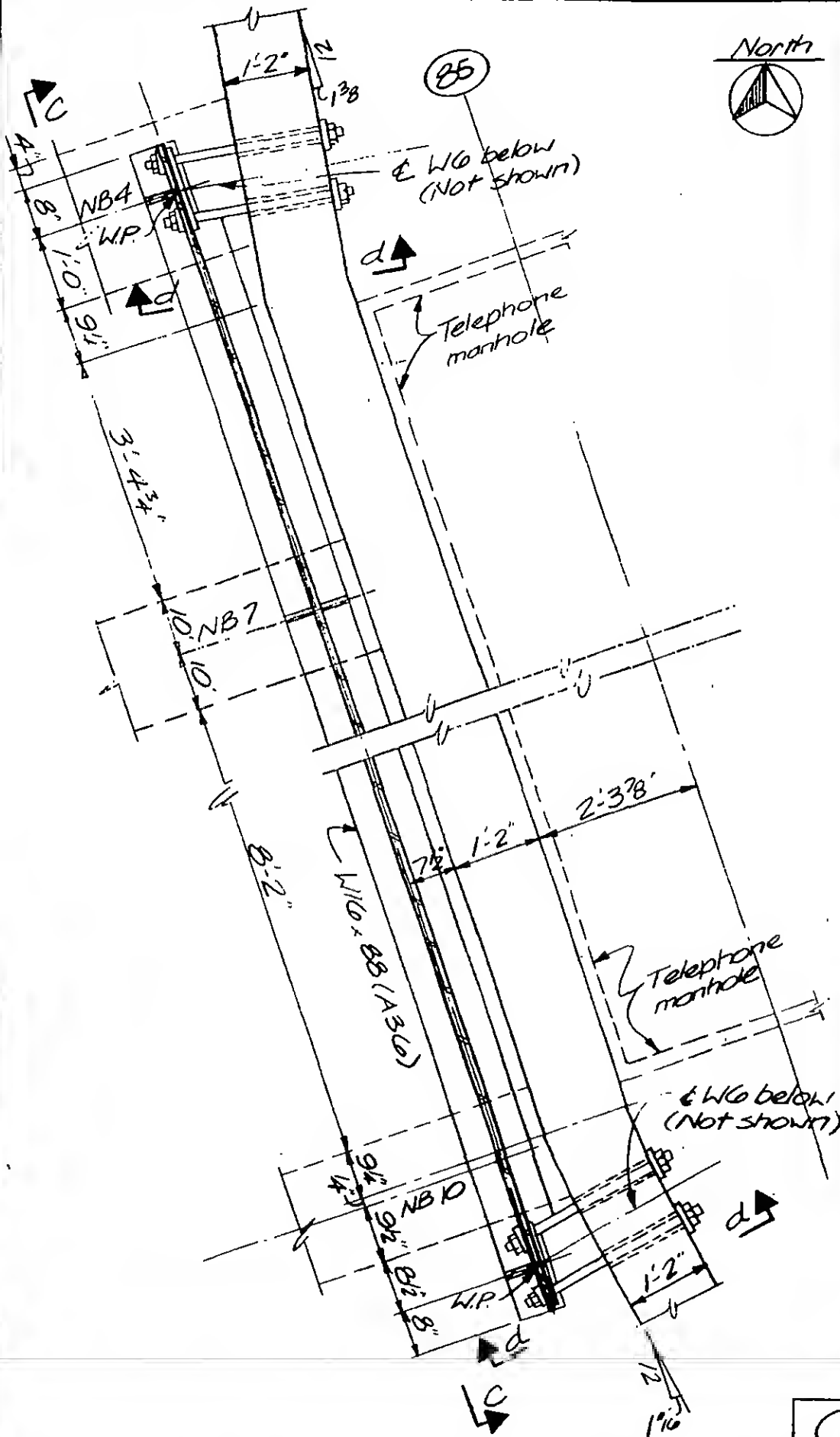
B

a

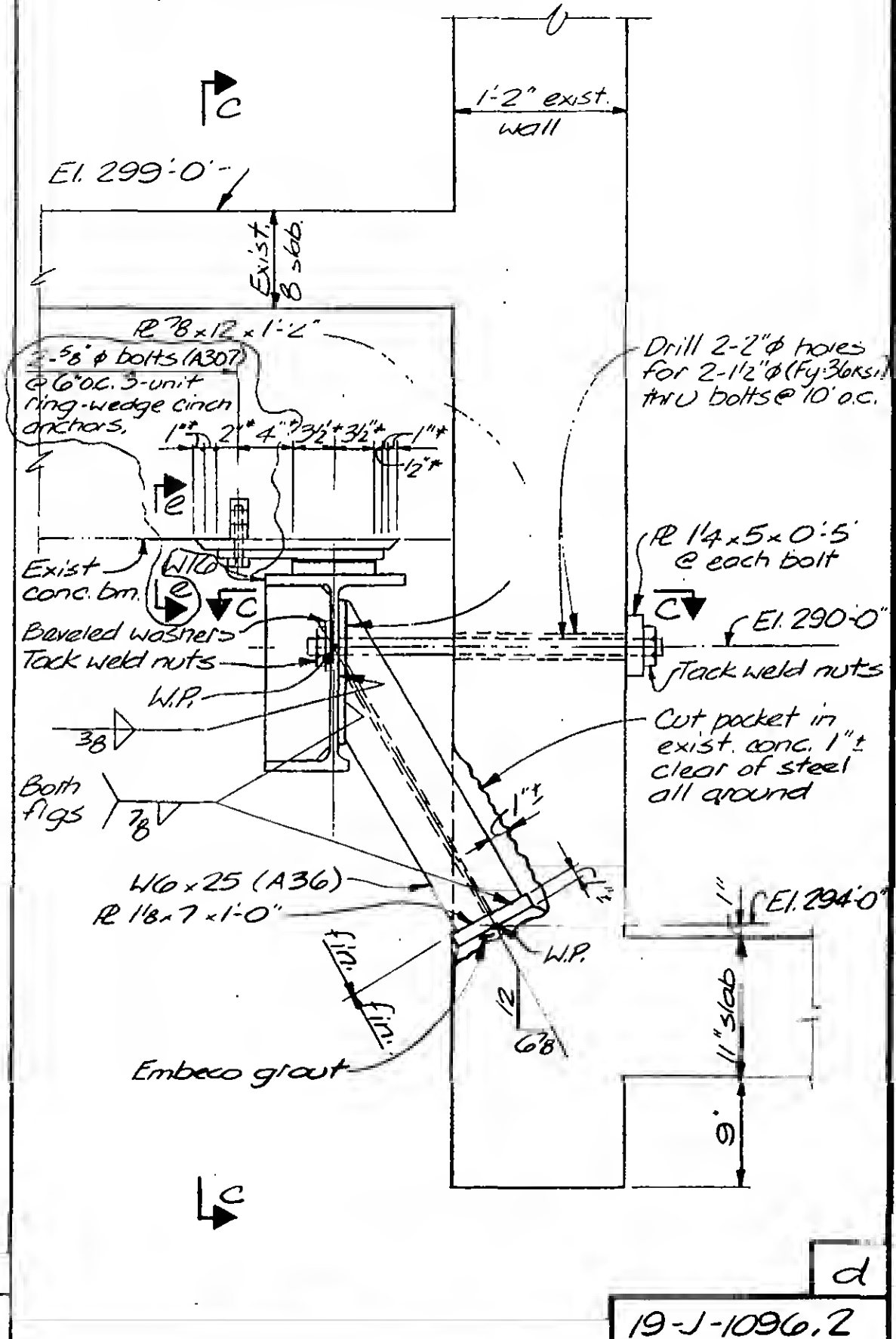
19-J-1096.1

REVISIONS

4-14-75



* These dimensions perpendicular to longitudinal axis of WIC



DESIGNED JTM

DRAW JB

REVIEWED
ETL

19-J-1096.2

PROJECT

THE WORLD TRADE CENTER

TITLE

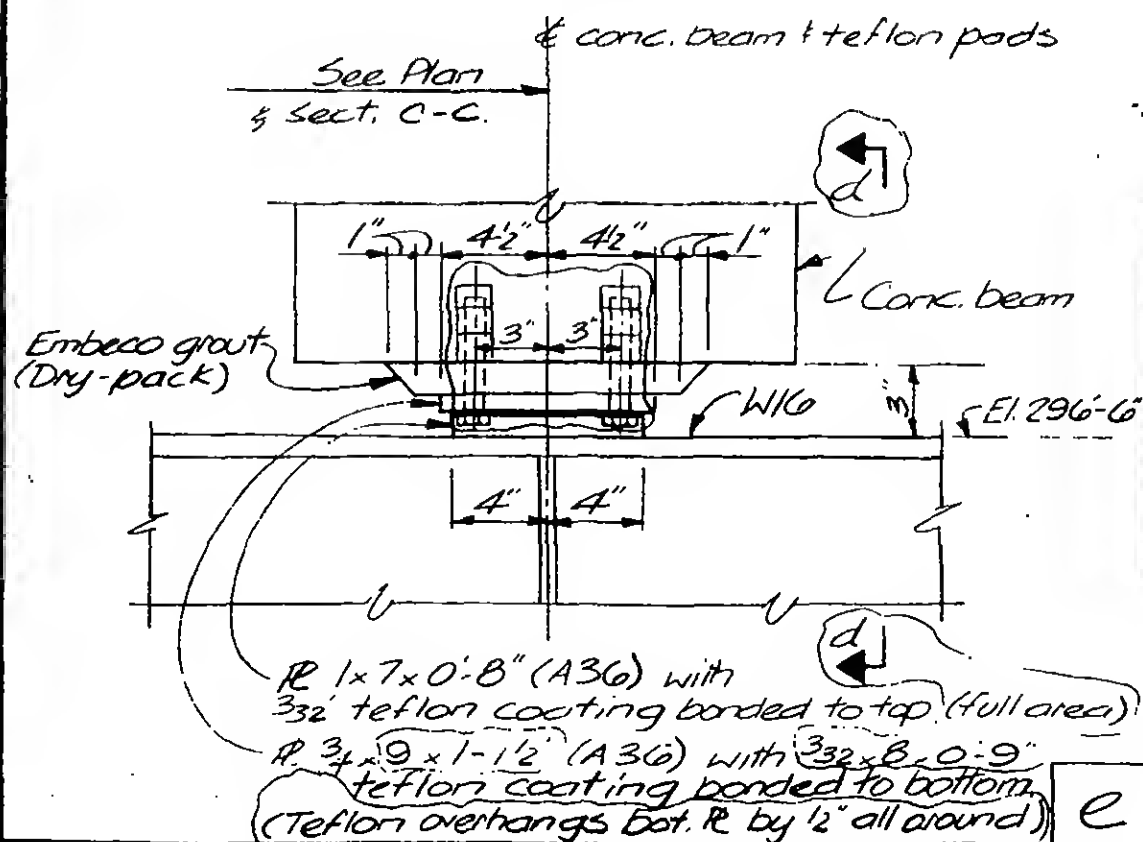
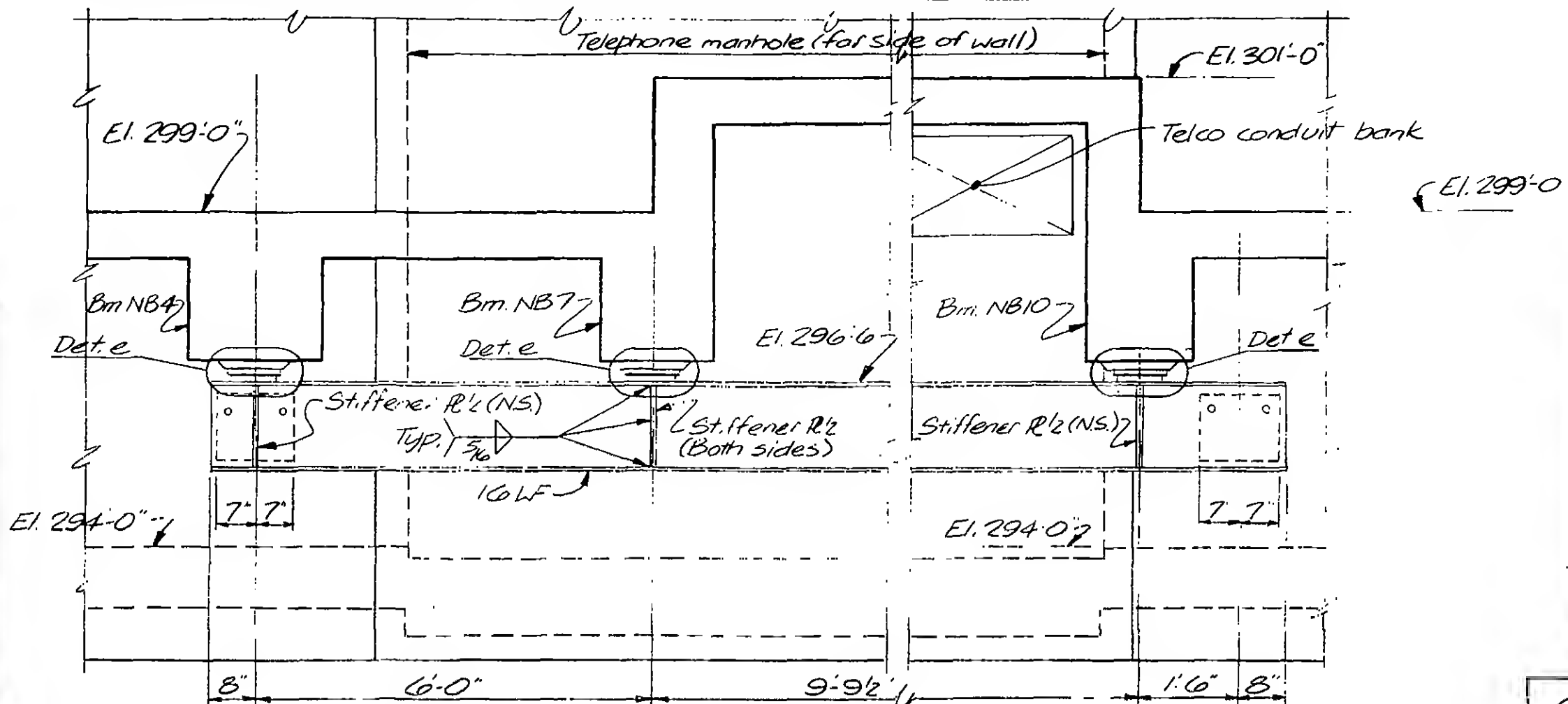
PLAZA - ZONE J-3 - EL. 299 - REPAIR

DATE

4-4-75

REVISIONS

4-14-75



DESIGNED

JTM

DRAWN

JB

REVIEWED

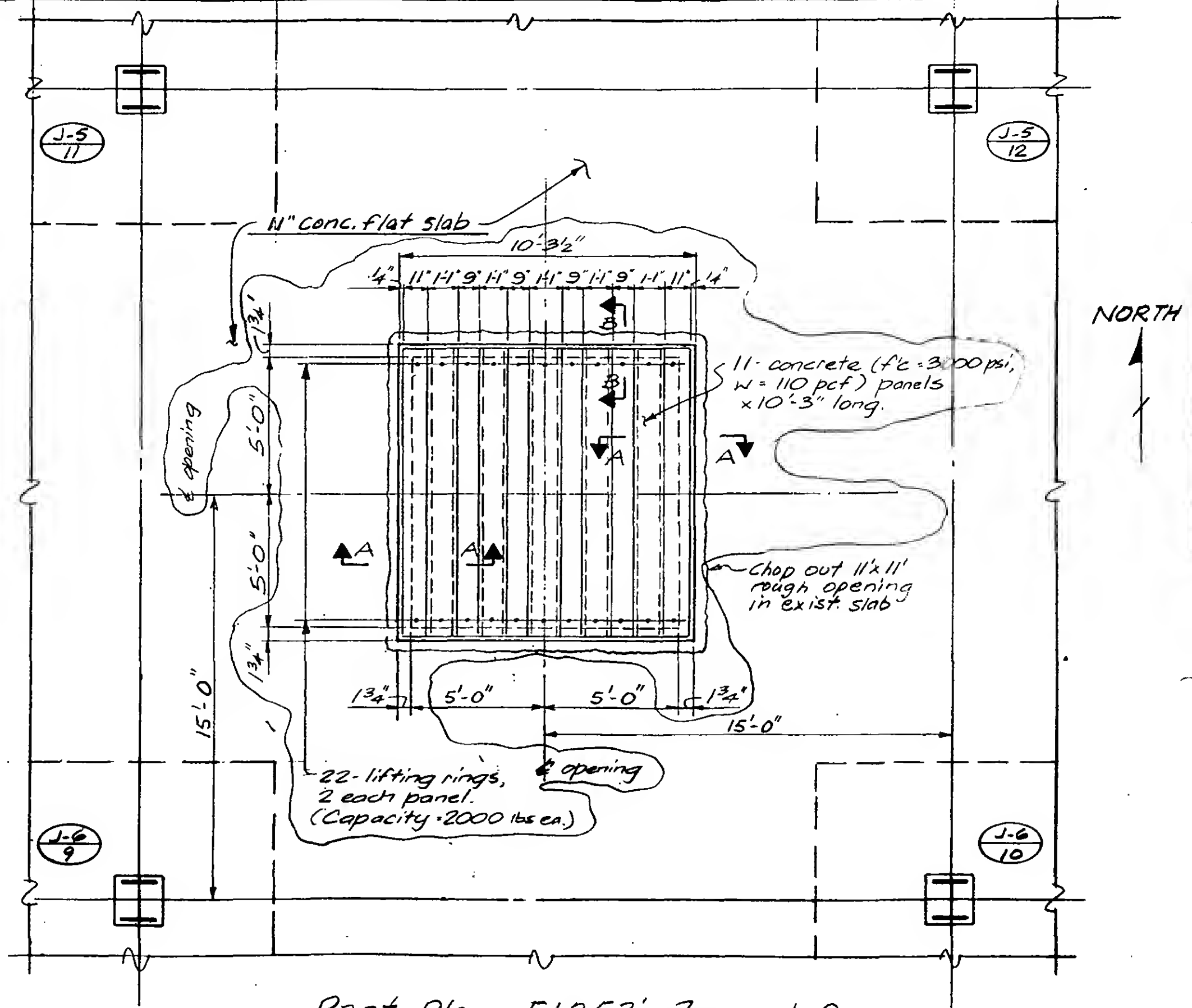
ETL

19-J-1096.3

REVISIONS

9-23-75

12-4-75



DESIGNED
F. Sayani

DRAWN
A.L. Frangui

REVIEWED
J.T.M.

Part Plan E1.253'-Zone J-2

19-J-1097.1

SKILLING, HELLE, CHRISTIANSEN, ROBERTSON

Structural & Civil Engineers

PROJECT THE WORLD TRADE CENTER

TITLE 10'x10" OPENING AT ELEVATION 253'

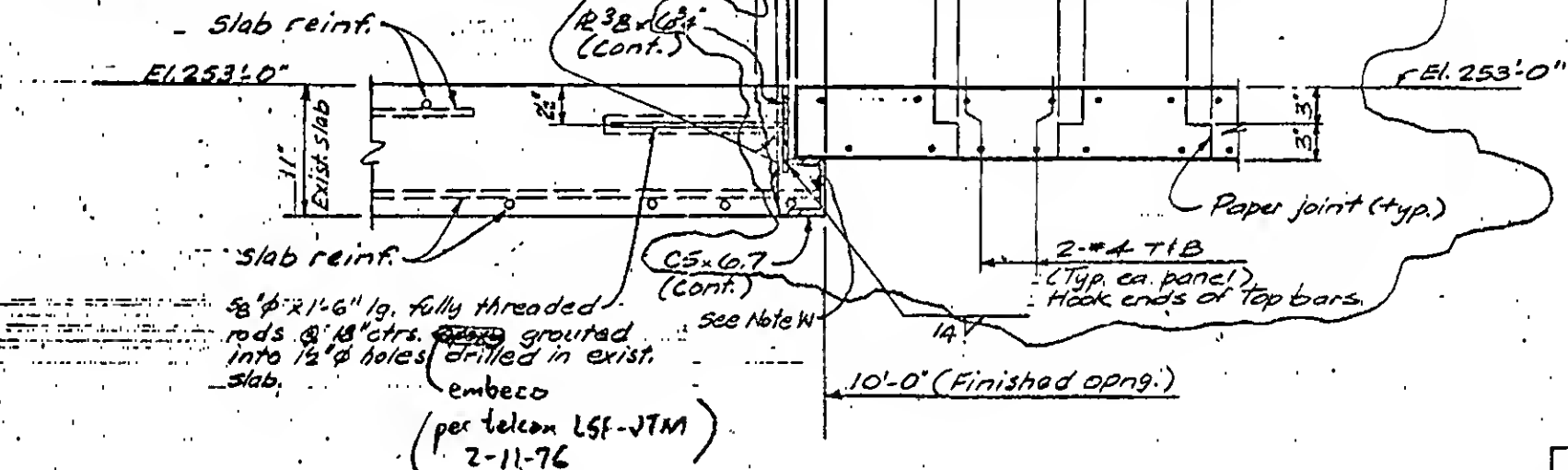
DATE 1-4-75

REVISIONS

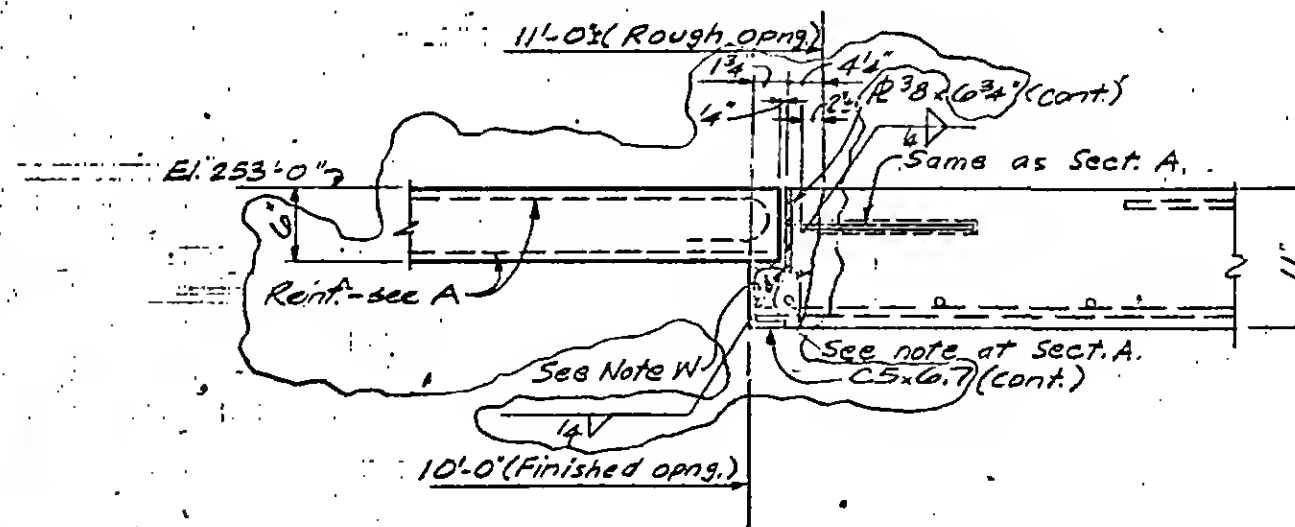
① 9-23-75

② 12-4-75

Clean face of exist. conc. and thoroughly coat entire surface with approved epoxy bonding compound just before casting new "non-shrink" $f_c = 4000$ psi concrete.



A



B



DESIGNED F. S. 4001

DRAWN A. L. Franqui

REVIEWED

J.T.M.

Note W:

Field weld ends of existing slab reinforcement to web of channel.

19-J-1097.2

PROJECT THE WORLD TRADE CENTER

TITLE 10'x10" OPENING AT ELEVATION 253'

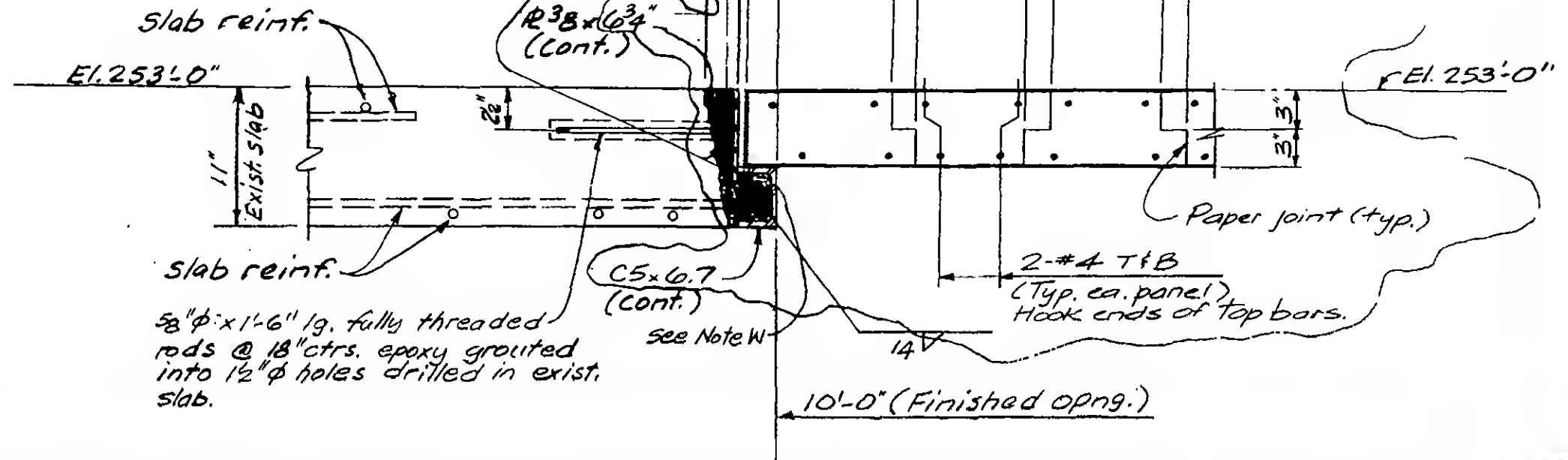
DATE 9-4-75

REVISIONS

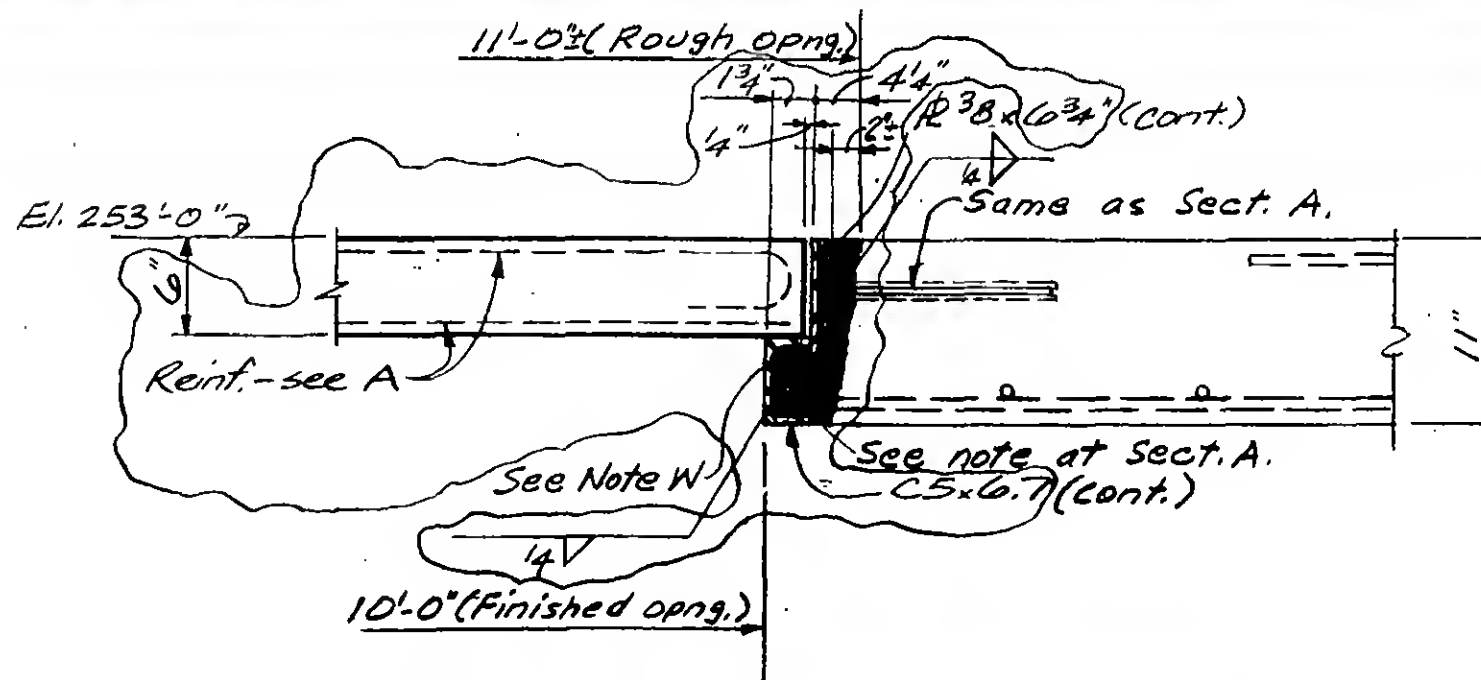
9-23-75

12-4-75

Clean face of exist. conc. and thoroughly coat entire surface with approved epoxy bonding compound just before casting new "non-shrink" $f'_c = 4000$ psi concrete.



A



B

Note W:

Field weld ends of existing slab reinforcement to web of channel.



DESIGNED F. S. J. W.

DRAWN A. L. Franqui

REVIEWED

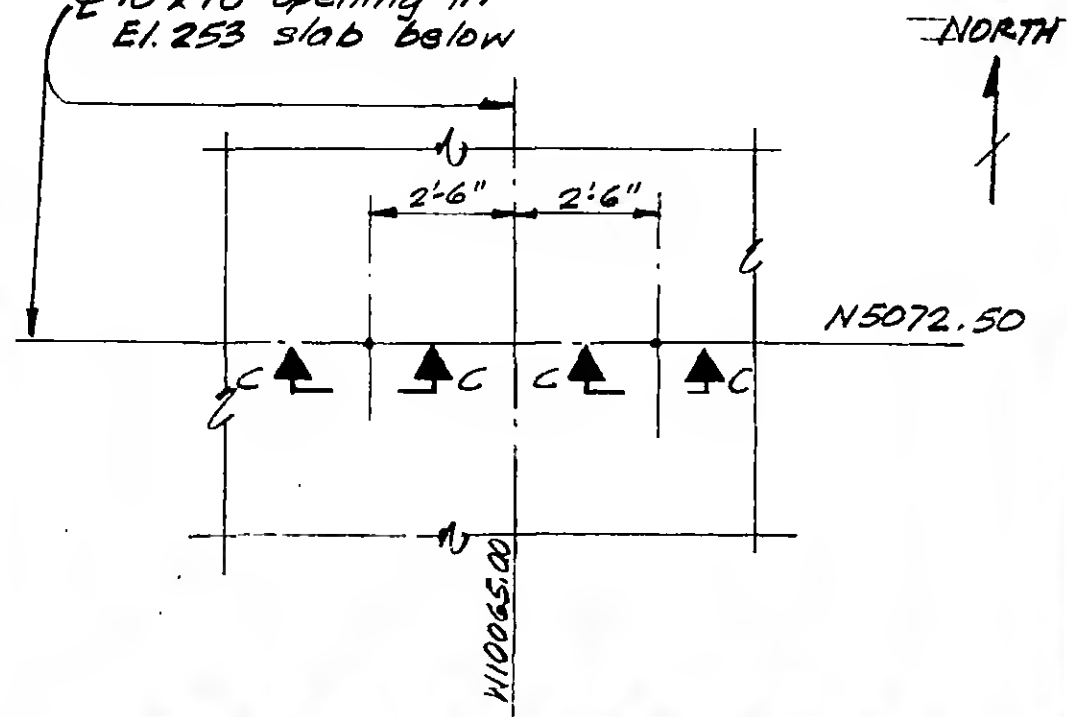
J.T.M.

19-J-1097.2

PROJECT THE WORLD TRADE CENTERTITLE LIFTING EYES @ ELEVATION 274DATE 9-4-75

REVISIONS

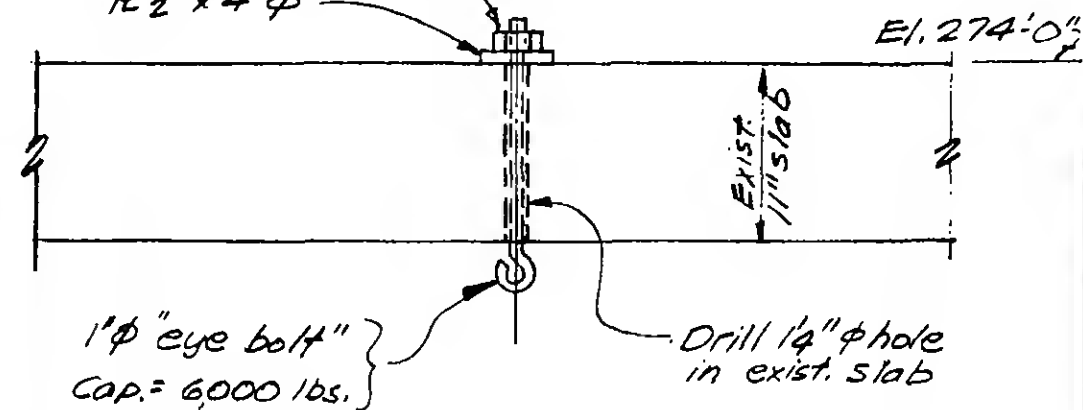
10'x10' opening in
El. 253 slab below



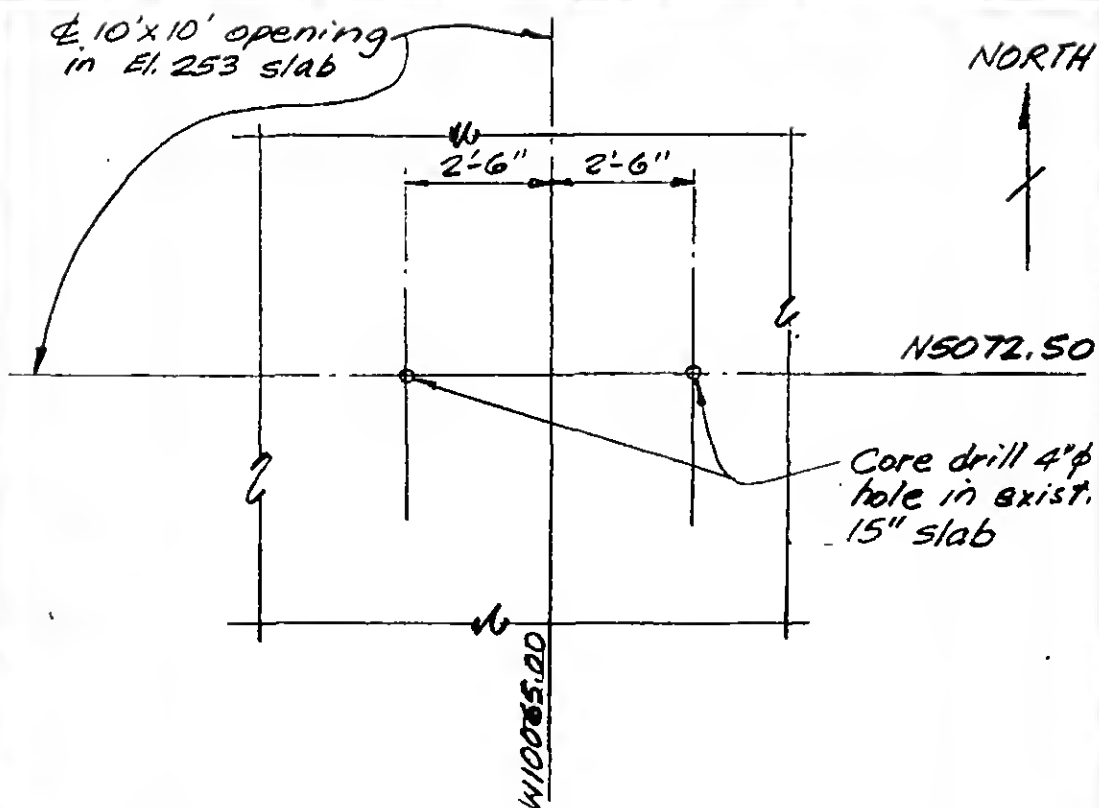
Part Plan - El. 274 - Zone J-2

Nut-shop weld to $\frac{1}{2}$ "
spoiled threads after
installation.

$R\frac{1}{2} \times 4"$



10'x10' opening
in El. 253 slab



Part Plan - El. 264 - Zone J-2



SIGNED
T. McGuinness

DRAWN
M. M. M.

REVIEWED
J.T.M.

19-J-1097.3

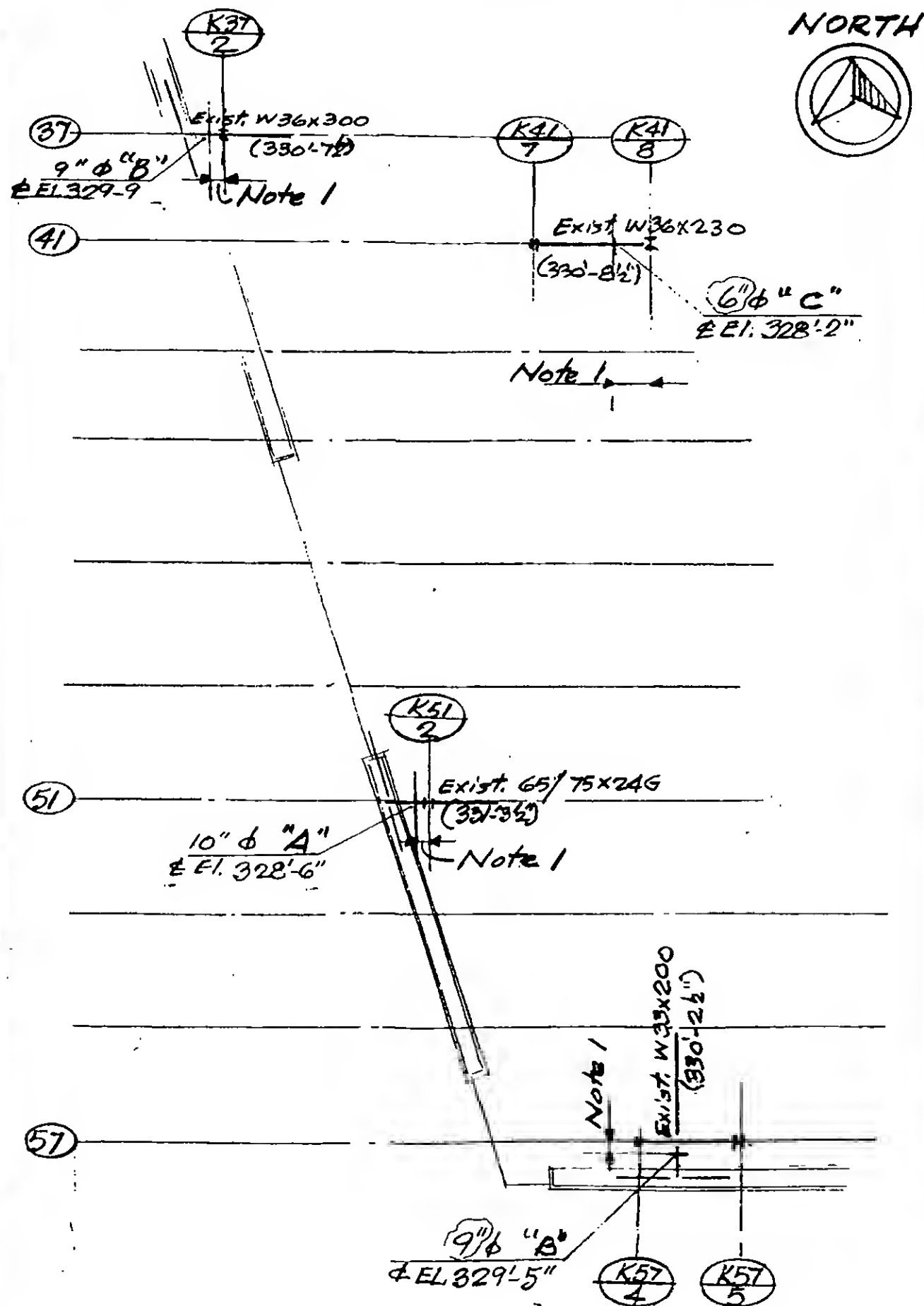
Structural & Civil Engineers

PROJECT

DATE 11-4-75

REVISIONS

11-20-75

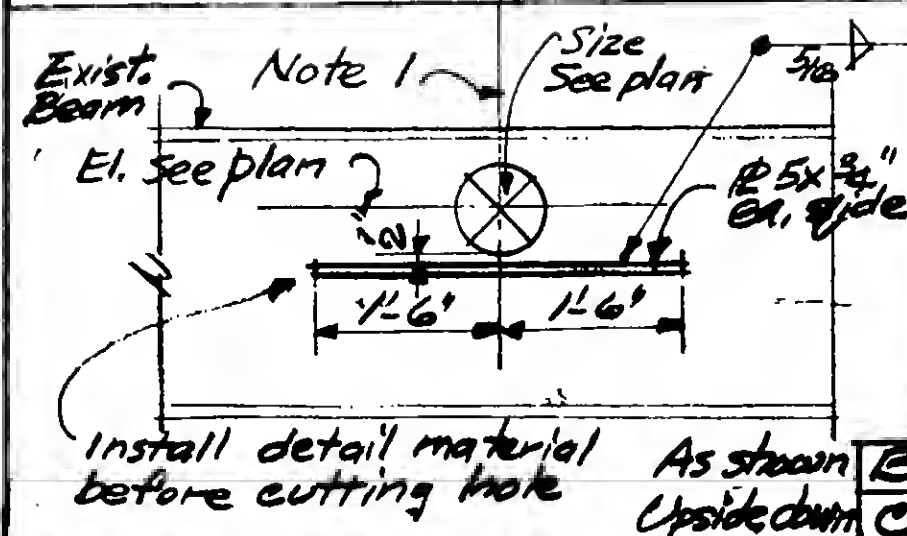
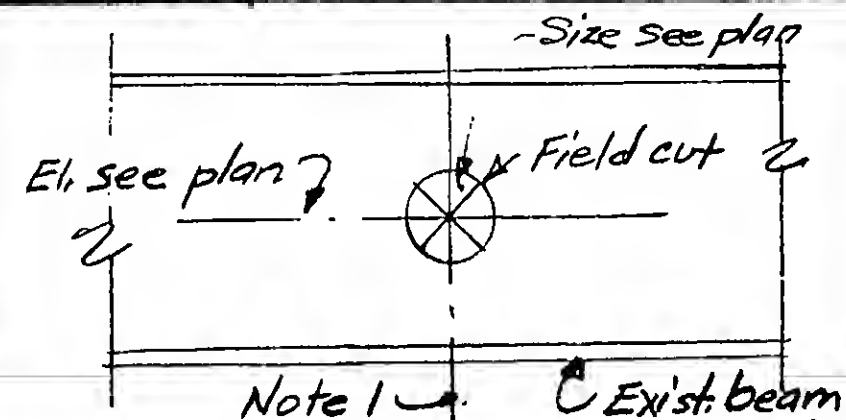


NOTES:

NOTES:
1. Plan location per approved
Plumbing shop drawings.

2. All new ϕ ASTM-A36
All welding electrodes -
ET0xx low hydrogen
type.

3. Work this dwg. with
dwg. P 770.548-3 which
is part of WTC 770.548.



PART PLAN EL. 932
ZONE K1, K3 & K5
(NO SCALE)

19-K-1098



DESIGNED

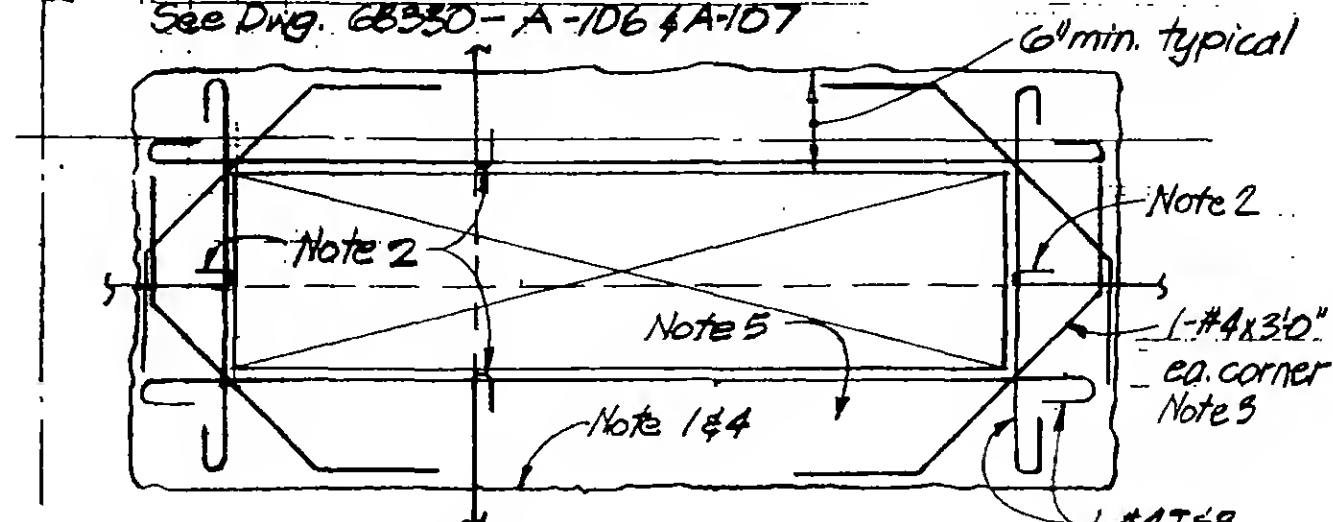
DRAWN

REVIEWED

PROJECT: THE WORLD TRADE CENTER TITLE: TEL/CO REVISIONS- TOWER B FL. 11&12

DATE 7-9-71

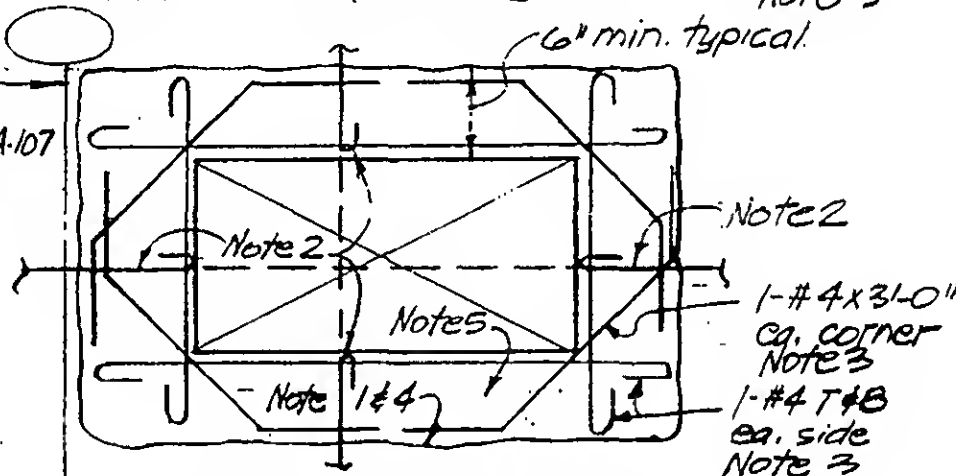
REVISIONS

Col. N^o. 151, 153, 307, 309 FL. 11 & 12
See Dwg. 68330-A-106 & A-107

1'-0" x 4'-0" openings

Notes:

1. Remove existing concrete to line indicated without damaging existing reinf.
2. Cut existing reinf. and hook at edge of opening.
3. Add new reinf. as indicated.
4. Clean face of exist. concrete and thoroughly coat entire surface with epoxy bonding compound.
5. Cast slab to edge of new opening using approved "non-shrink" $f_c = 4000$ psi concrete.
6. Slabs to be shored as required before removing exist. concrete.

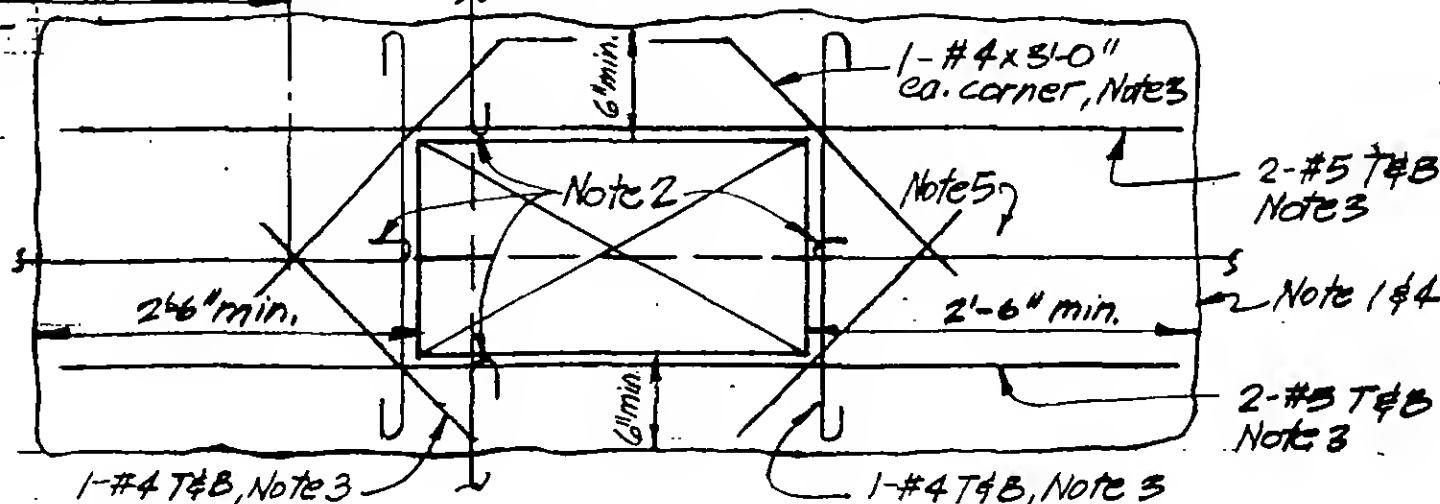
Col. 210, 223, 239, 246 FL. 11
Col. 210 FL. 12
See Dwg. 68330-A-106 & A-107

1'-0" x 2'-0" Openings

Floor 11 & 12 as noted

Col. 223, 239, 246 FL. 12

See Dwg. 68330-A-107

1'-0" x 2'-0" Opening
Floor 12 as noted

DESIGNED

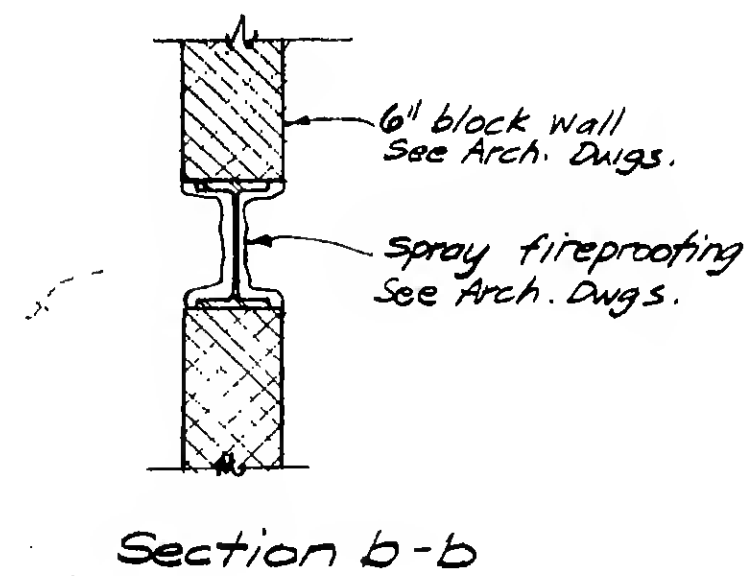
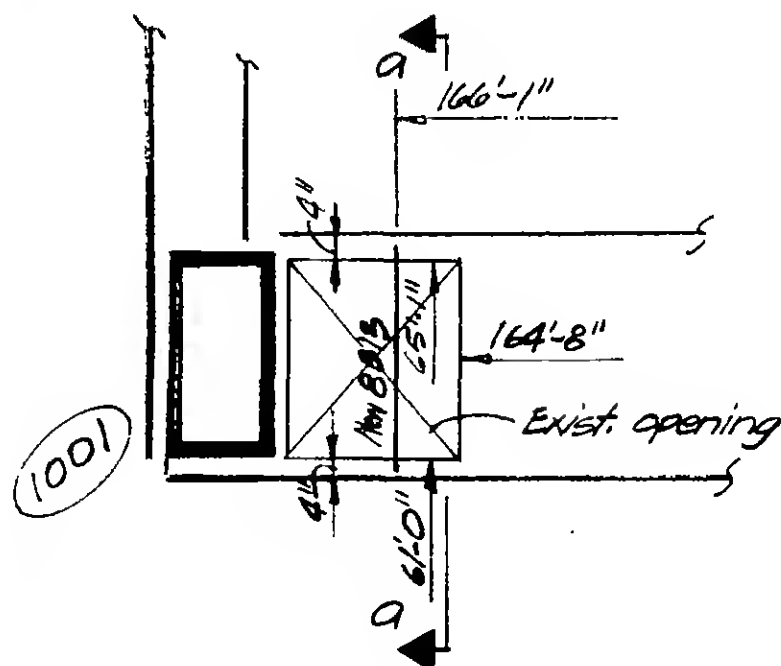
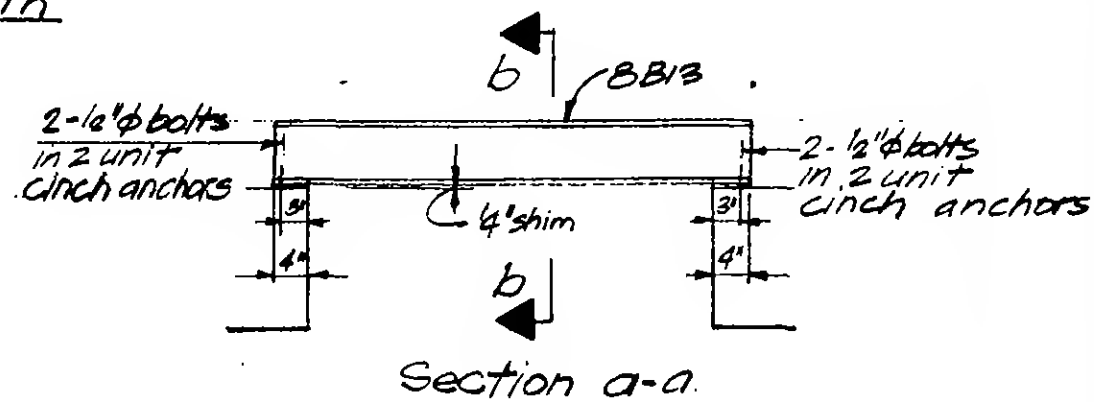
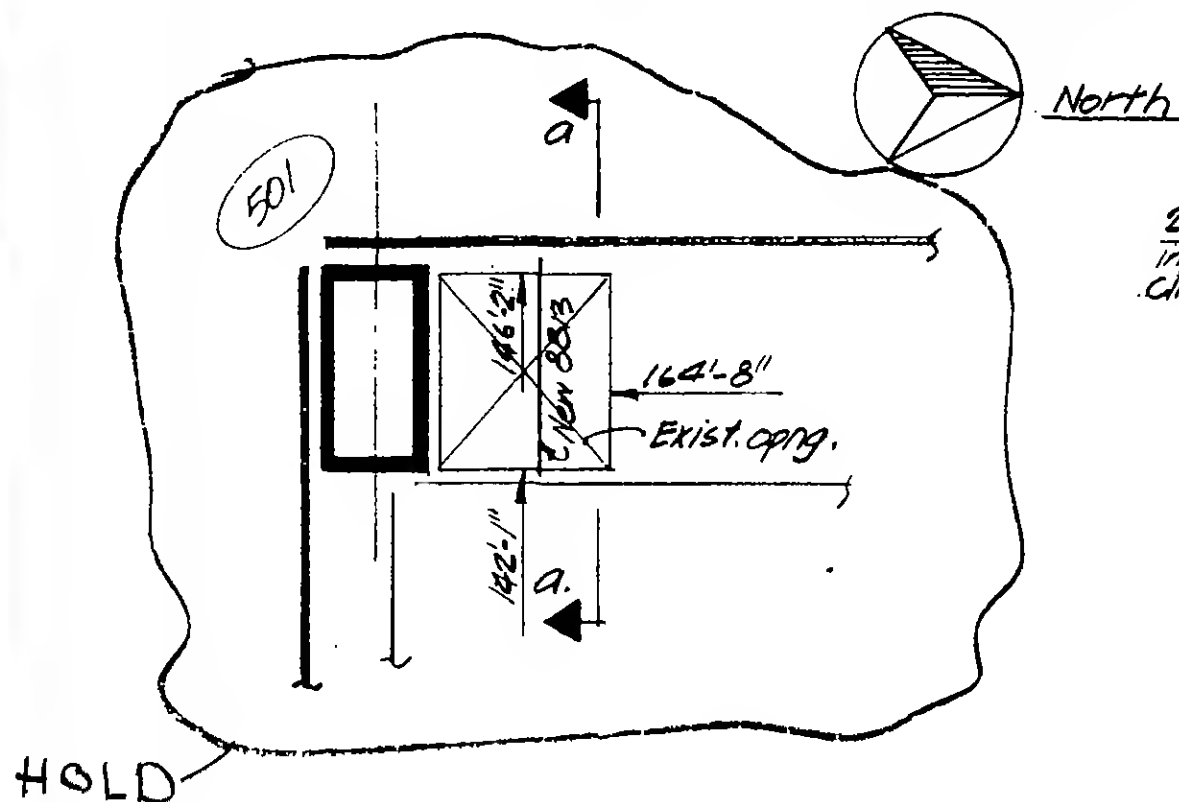
DRAWN

P.M. Oelke

REVIEWED

19-B-1100

REVISIONS



Part Plans
Elev. 264, 274, 284 & 294



DRAWN

FM Ozell

REVIEWED

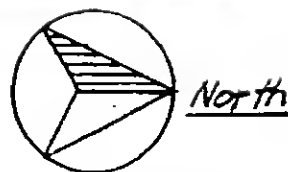
VOID

19-B-1101

REVISIONS

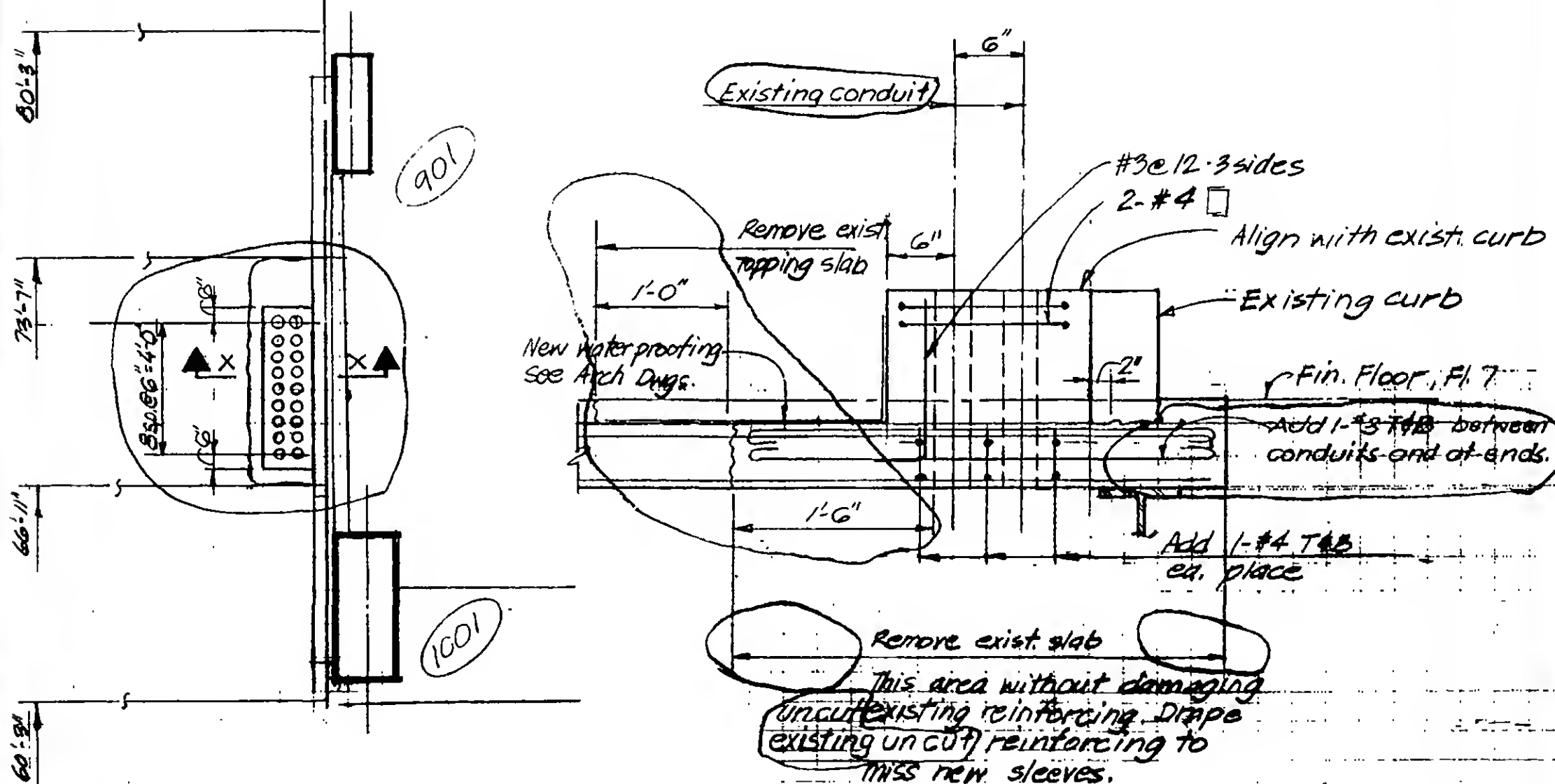
9-1-71

1-12-72



North

Note: Clean face of existing concrete and thoroughly coat entire surface with epoxy bonding compound and recast as indicated with approved non-shrink $f'_c = 4000$ psi concrete.



Part Plan Floor 7
Ref. SEA-17 & SCB-18

Section X-X



DESIGNED

DRAWN

REVIEWED

19-B-1102

PROJECT

THE WORLD TRADE CENTER

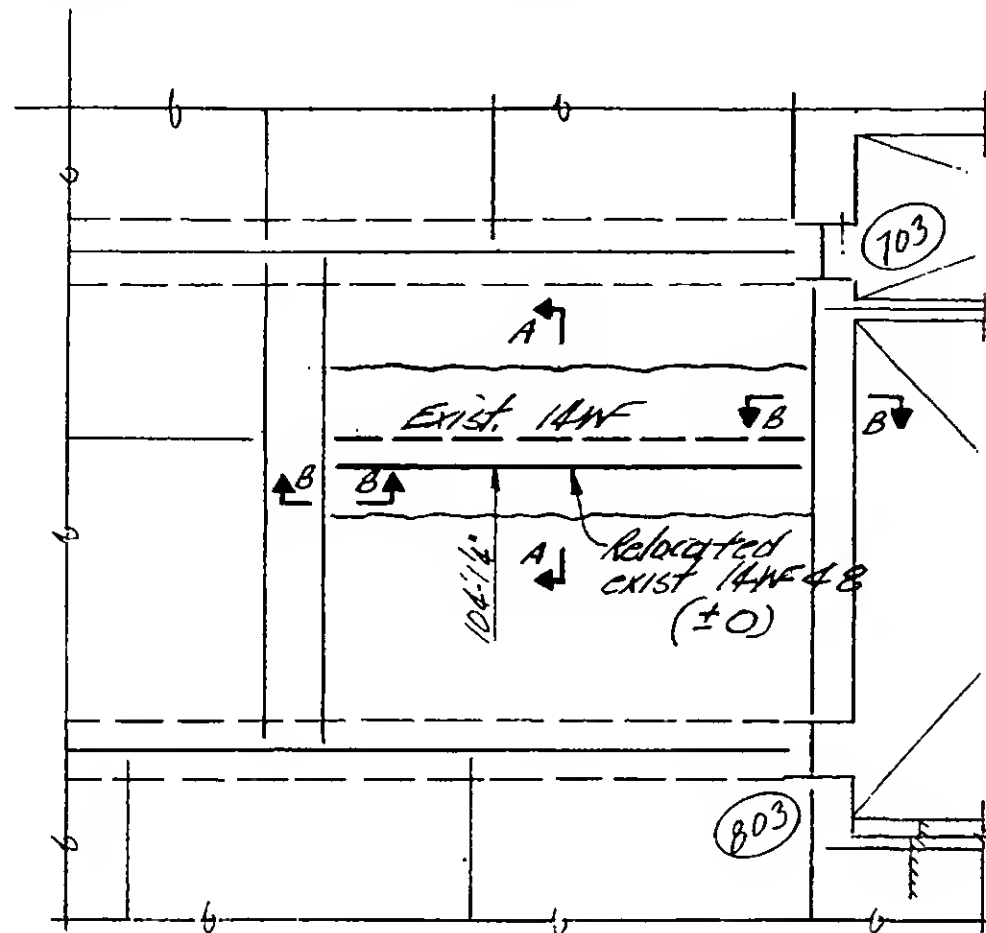
TITLE

FLOOR 105B - BUFFER BEAM ELEV. 99

DATE

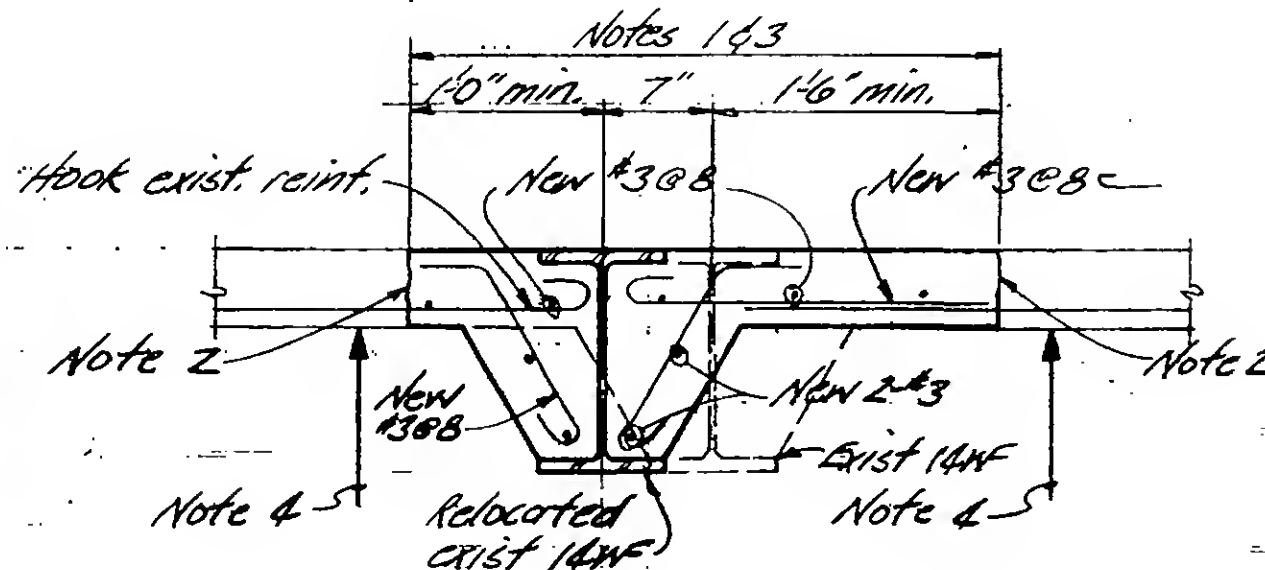
10/25/71

REVISIONS

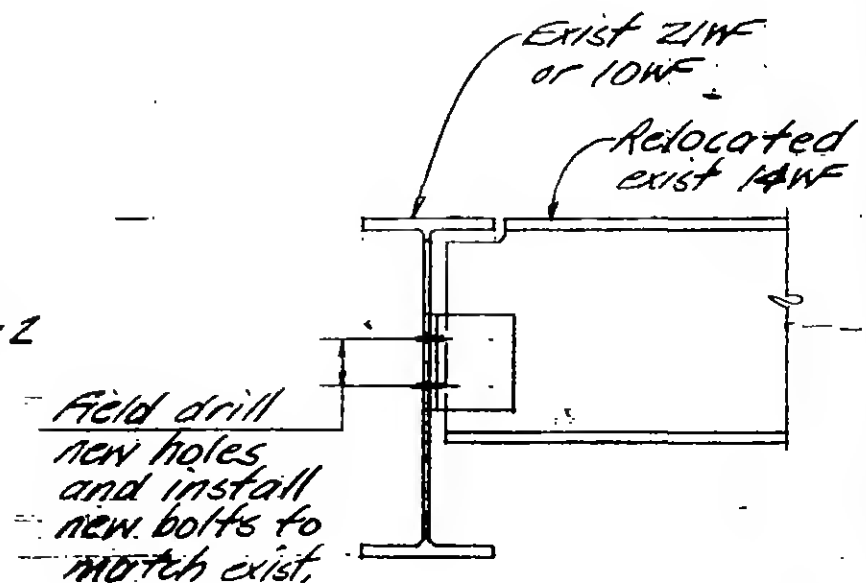


NOTES:

1. Remove existing concrete as indicated without damaging existing reinforcing.
2. Coat entire surface of existing slab with approved epoxy bonding compound.
3. Cast new slab with $f'_c = 3000$ psi lightweight aggregate approved "nonshrink" concrete.
4. Shore existing slab prior to removing concrete.



Section A-A



Section B-B



DESIGNED

DRAWN

REVIEWED

19-B-1103

PROJECT

THE WORLD TRADE CENTER

TITLE

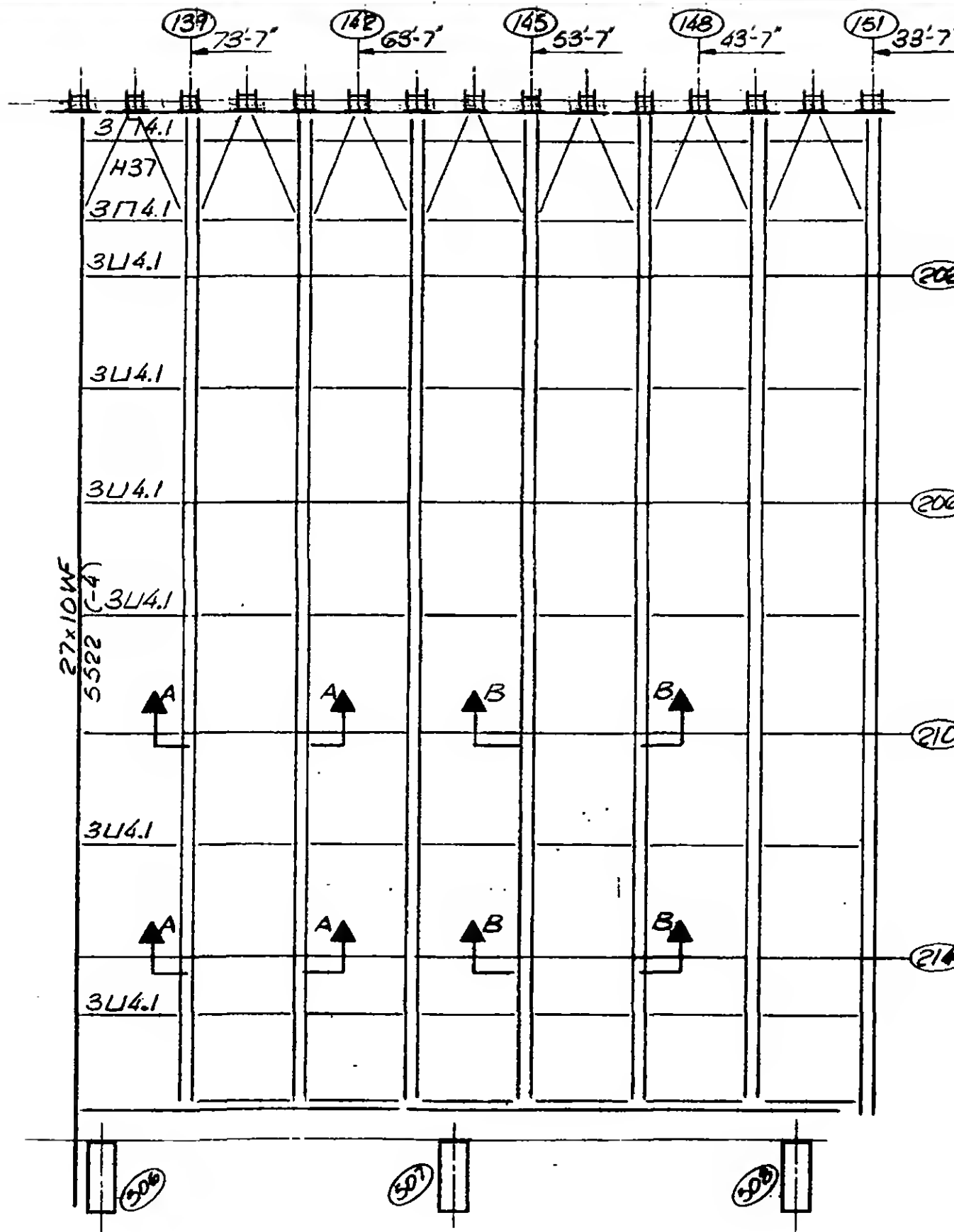
TOWER A - FLOOR 44 - PLAN

DATE

12-10-71

REVISIONS

NORTH



(210)

Notes:

1. All work to be accomplished in accordance with project specification.

2. All new structural steel to be ASTM A36.

3. All new welds to be made using E70XX low hydrogen electrode.

(214)

4. Remove exist. spray fireproofing as required to accomplish new work then replace on existing and fireproof new work.



DESIGNED

DRAWN

T.R.

REVIEWED

19-A-1104.1

PROJECT

THE WORLD TRADE CENTER

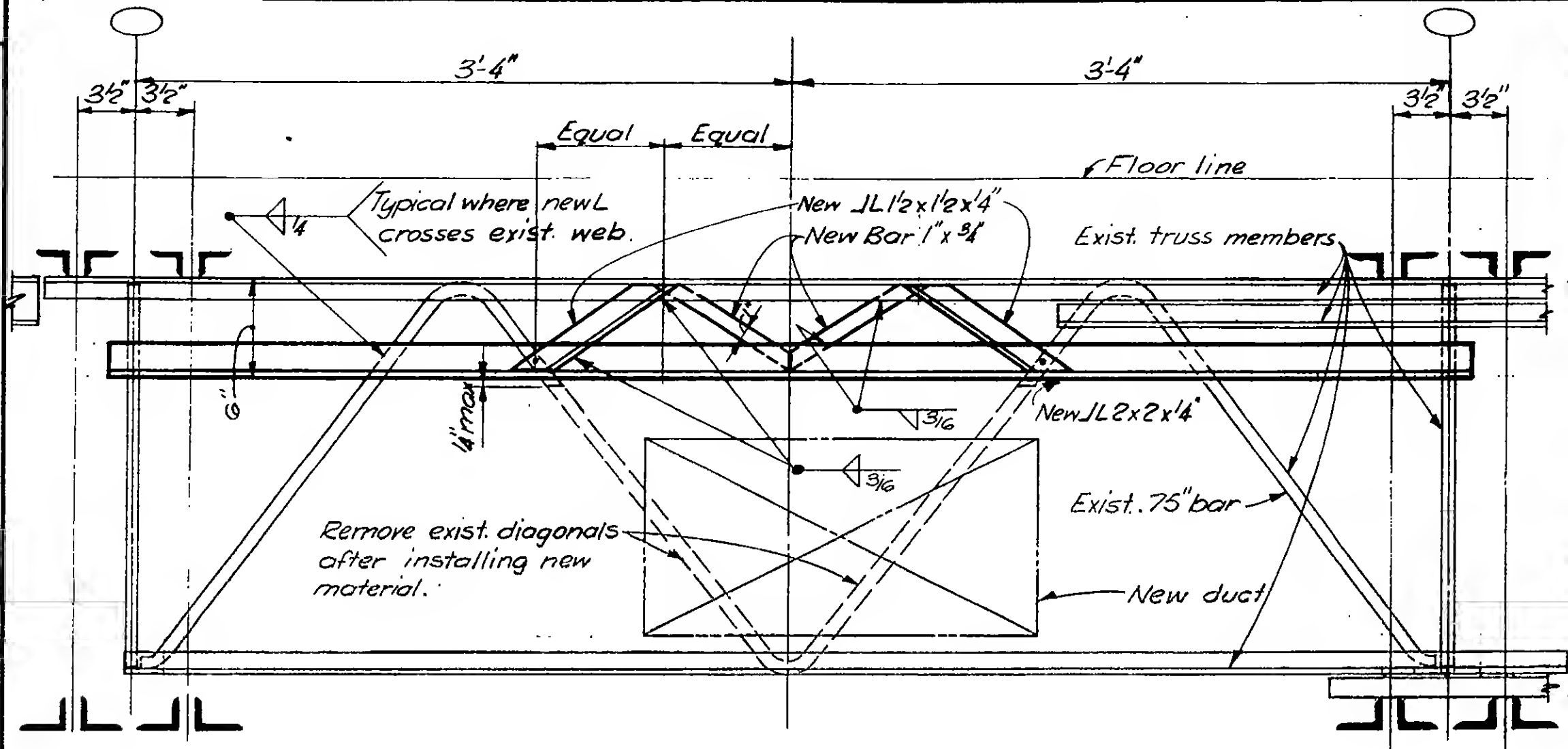
TITLE

TOWER A - FLOOR 44 - SECTION

DATE

12-10-71

REVISIONS



SECTION A-A



DESIGNED

DRAWN

T.R.

REVIEWED

19-A-1104.2

SKILLING, HELLE, CHRISTIANSEN, ROBERTSON

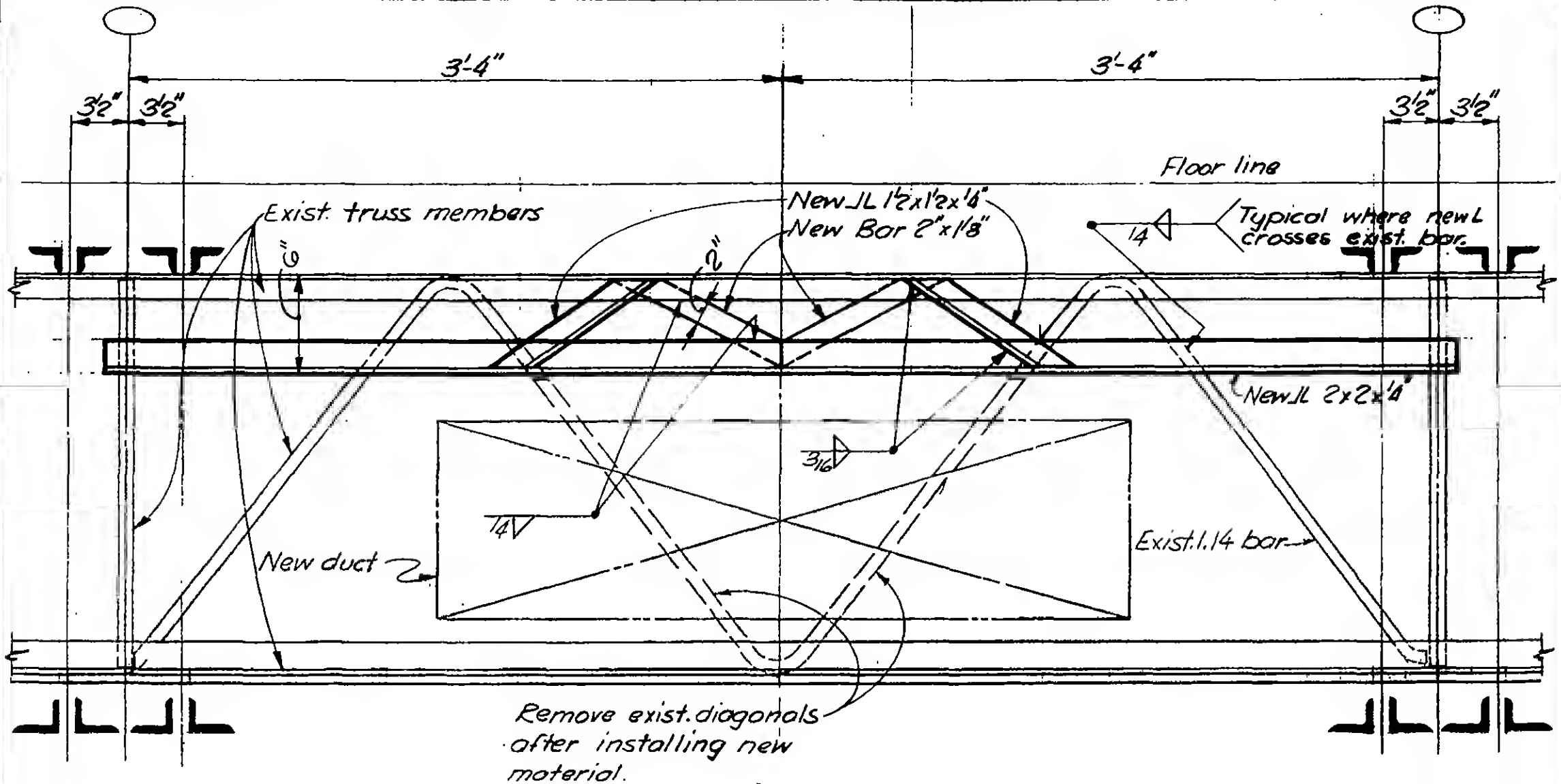
Structural & Civil Engineers

PROJECT THE WORLD TRADE CENTER

TITLE TOWER A - FLOOR 44 - SECTION

DATE 12-10-71

REVISIONS



SECTION B-B



DESIGNED

DRAWN
T.R.

REVIEWED

19-A-1104.3

PROJECT

THE WORLD TRADE CENTER

TITLE

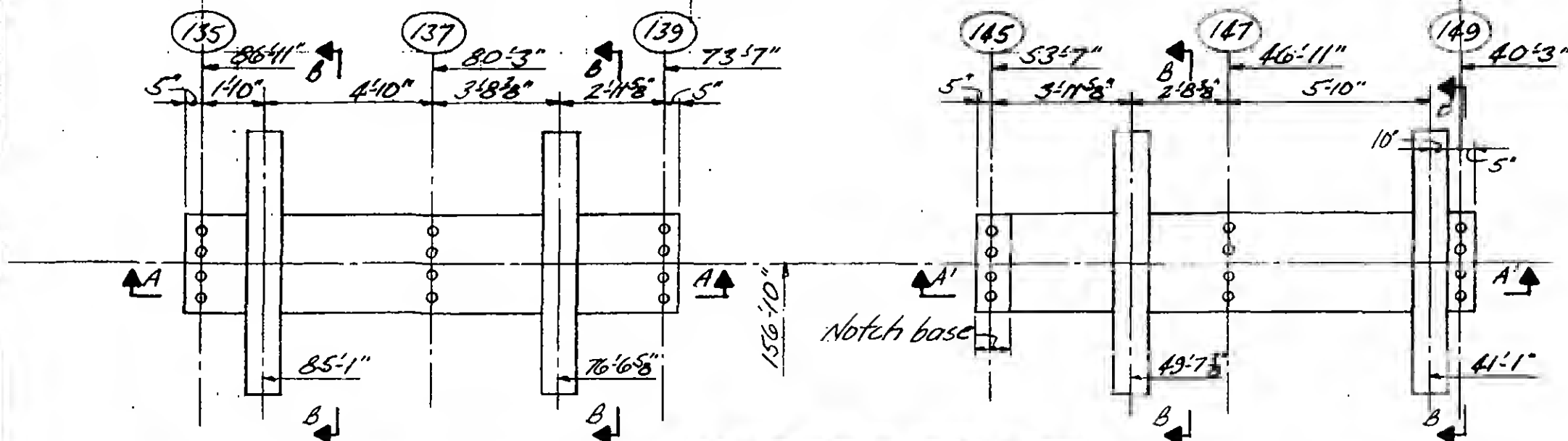
HEAT EXCHANGER & PUMP BASE - TOWER A FLOOR 43

DATE

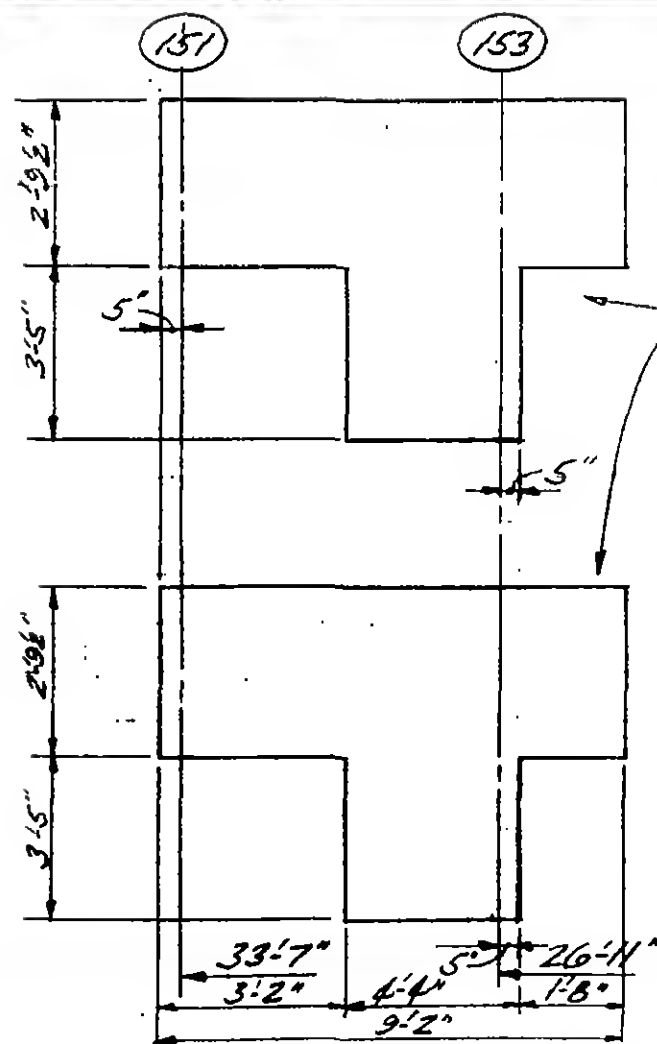
12/14/71

REVISIONS

2/18/72



Part Plan - Floor 43



Part Plan - Floor 43

See approved
Mech. Shop Dwg.
for locations
of 6" thick pump
bases. Reinforce
with #4 @ 8 T & b,
each way.

Notes:

1. All work and materials shall conform to project specifications.
2. All concrete shall be stone aggregate concrete $f'_c = 3000$ psi.
3. All dimensions and locations shall be verified with, and all embedded items shall be coordinated with, approved Mechanical Shop Drawings before casting concrete bases.



DESIGNED

DRAWN

J. Adams

CHECKED

W. Adams

19-A-1105.1

PROJECT

THE WORLD TRADE CENTER

TITLE

HEAT EXCHANGER & PUMP BASE - TOWER A FLOOR 43

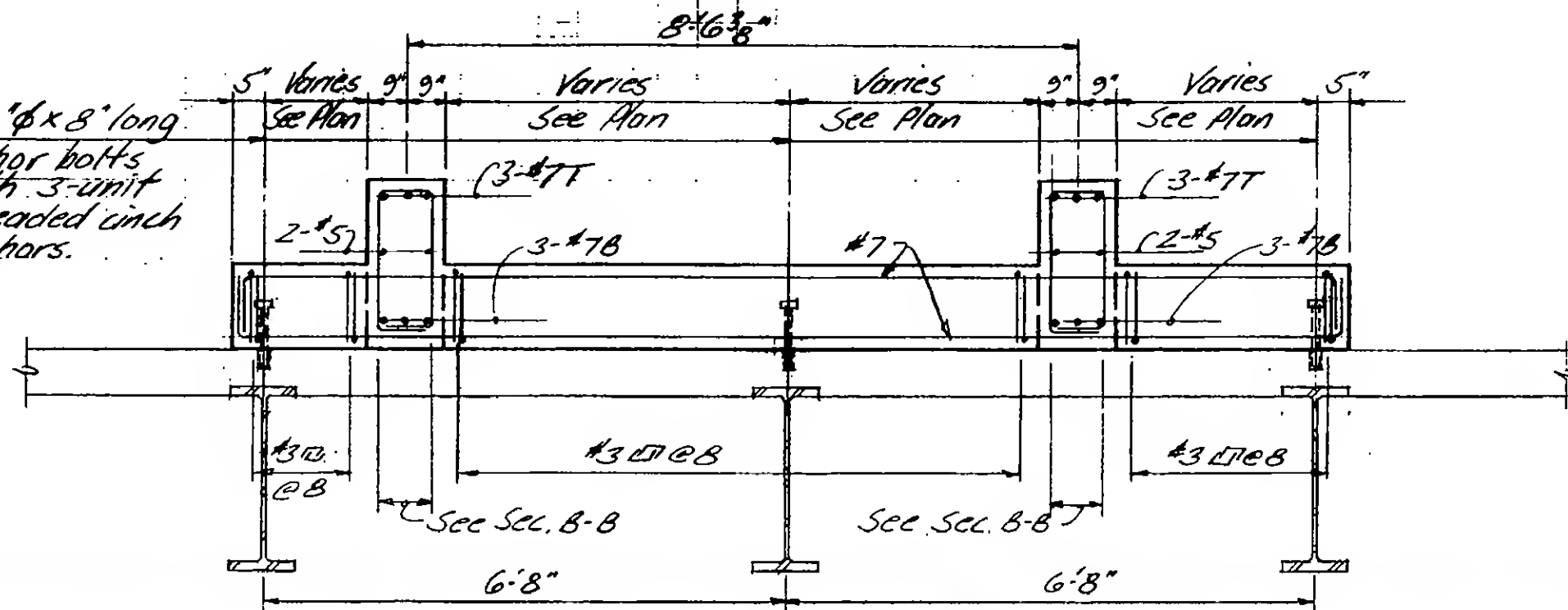
DATE

12/14/71

REVISIONS

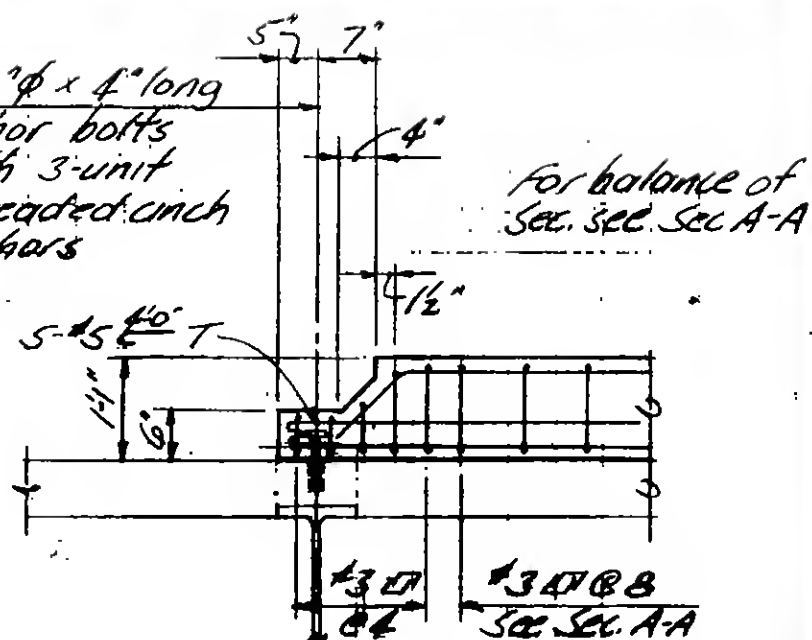
2/18/72

4-3/4" ϕ x 8" long
anchor bolts
with 3-unit
threaded cinch
anchors.

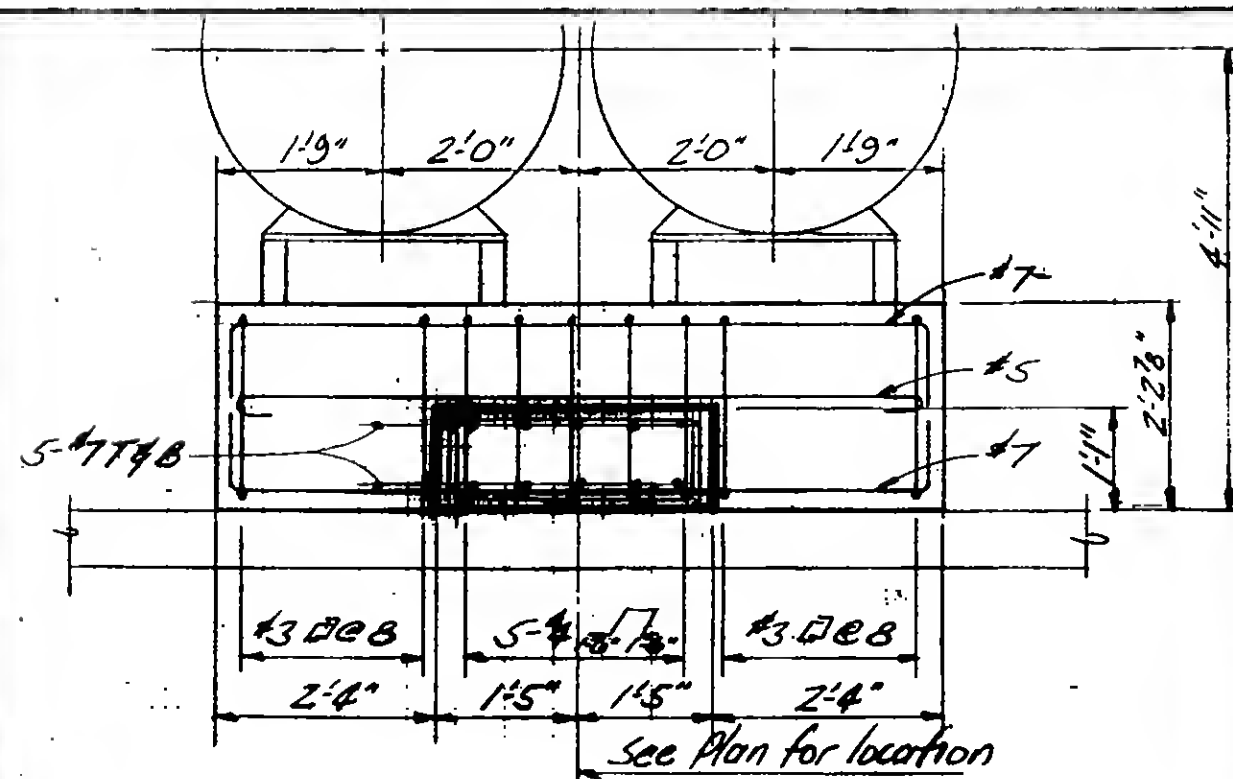


Section A-A

4-3/4" ϕ x 4" long
anchor bolts
with 3-unit
threaded cinch
anchors



Section A-A'



Section B-B



DESIGNED

J. Adams

REVIEWED

W. Brewer

19-A-1105.2

PROJECT

THE WORLD TRADE CENTER

TITLE

TELCO REVISIONS TOWER B FL. 9 & 10

DATE _____

12-13-71

REVISIONS

1-12-72

General Rev.

See Notes on
19-B-1106.2

Core drill 5"φ

-- See Notes

-Core drill 5" ϕ "

See Notes

- Add 1/8" \leftrightarrow T&B Typ.
ea. side and between
sleeves or conduit.

- See Notes

- Core drill 5" ϕ

- Core drill
5" ϕ

- See Notes

- Core drill 5" ϕ .



DESIGNED

DRAWN
P. H. C. C. C.

REVIEW

Floor 9

Floor 10

19-B-1106.1

File: 117
 11/12/10

SKILLING, HELLE, CHRISTIANSEN, ROBERTSON

Structural & Civil Engineers

PROJECT THE WORLD TRADE CENTER

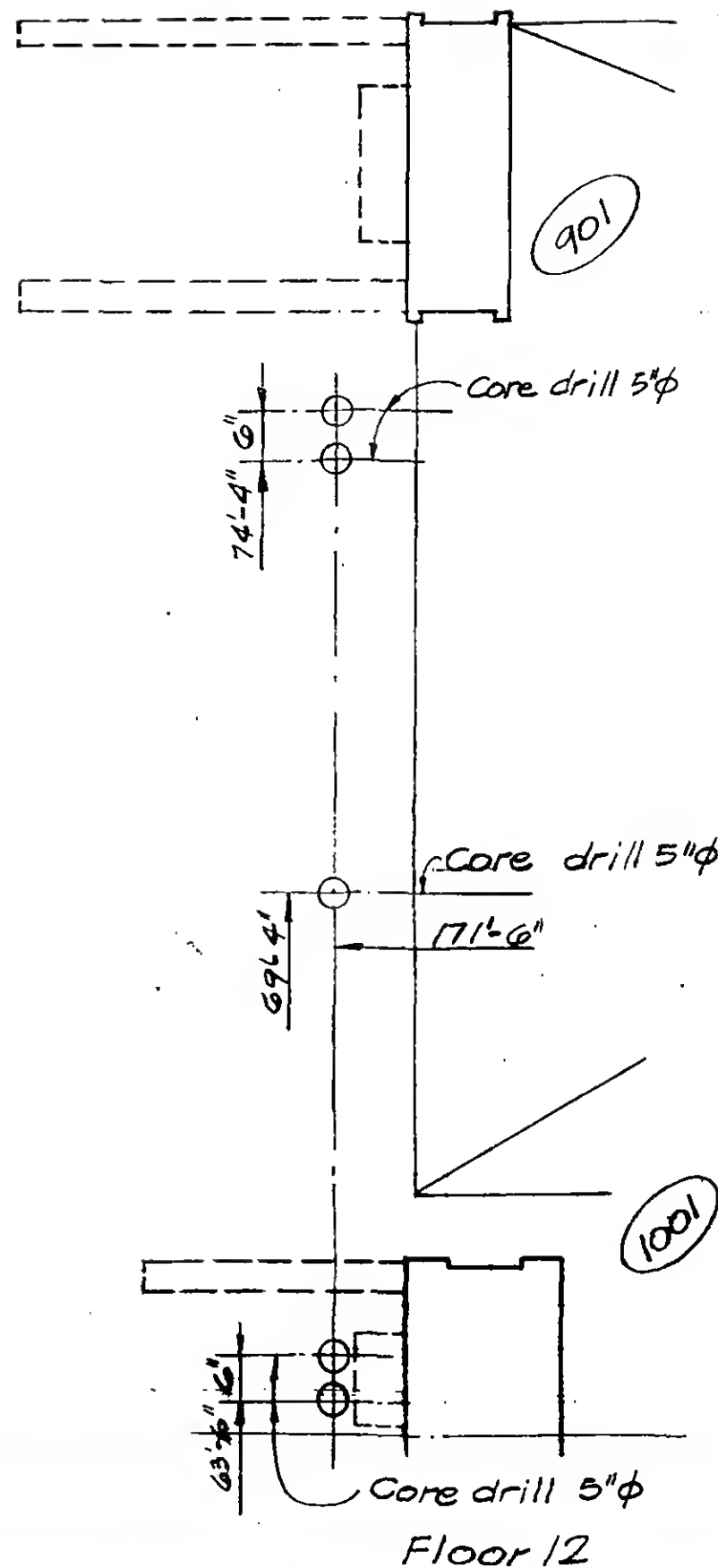
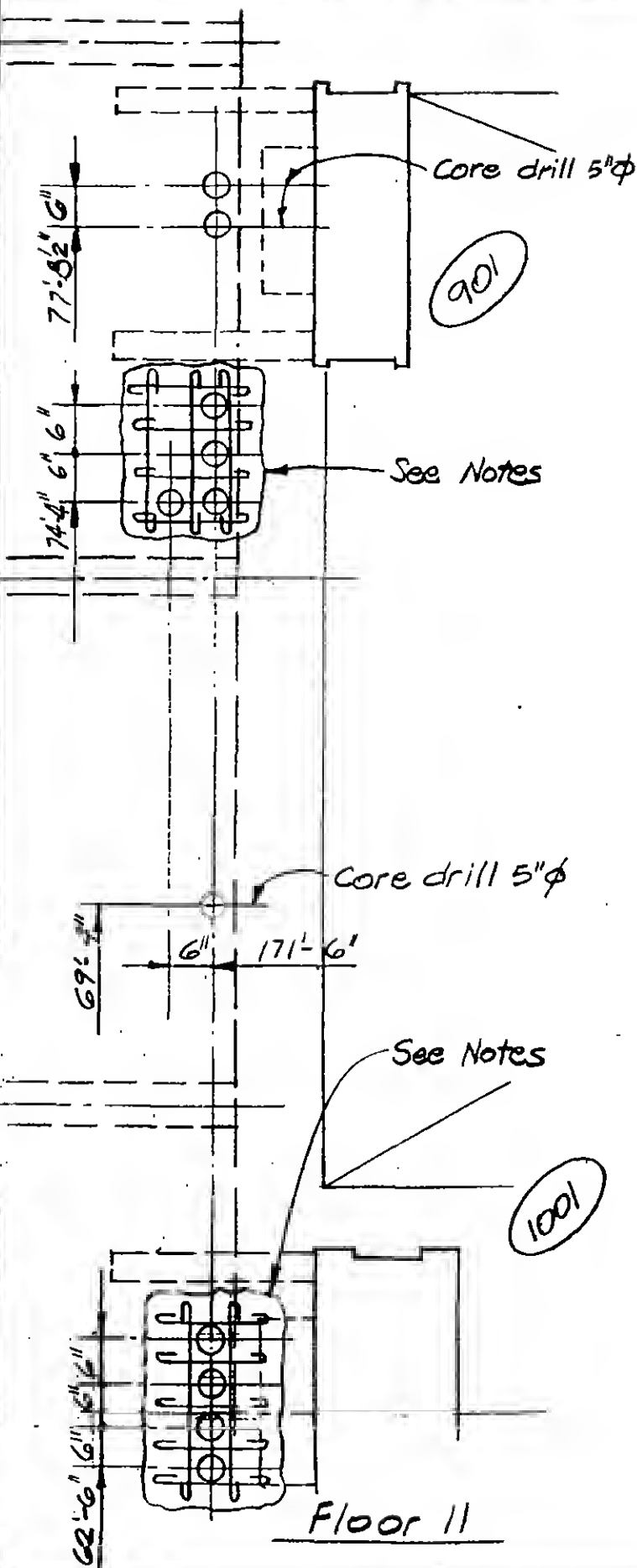
TITLE TEL/CO REVISIONS TOWER B FL. 11 & 12

DATE 12-13-11

REVISIONS

1-12-12

General Rev.



Notes:

1. Remove existing concrete to line indicated without damaging existing reinf.
2. Adjust existing reinf. without cutting to clear new sleeves or conduits
3. Add new reinf. as indicated
4. Clean face of exist. concrete and thoroughly coat entire surface with epoxy bonding compound.
5. Cast slab around new sleeves or conduits using approved "non-shrink" $f'_c = 4000 \text{ psi}$ concrete.
6. Slabs to be shored as required before removing existing concrete.



DESIGNED

DRAWN P. Moulie

W. Brewer

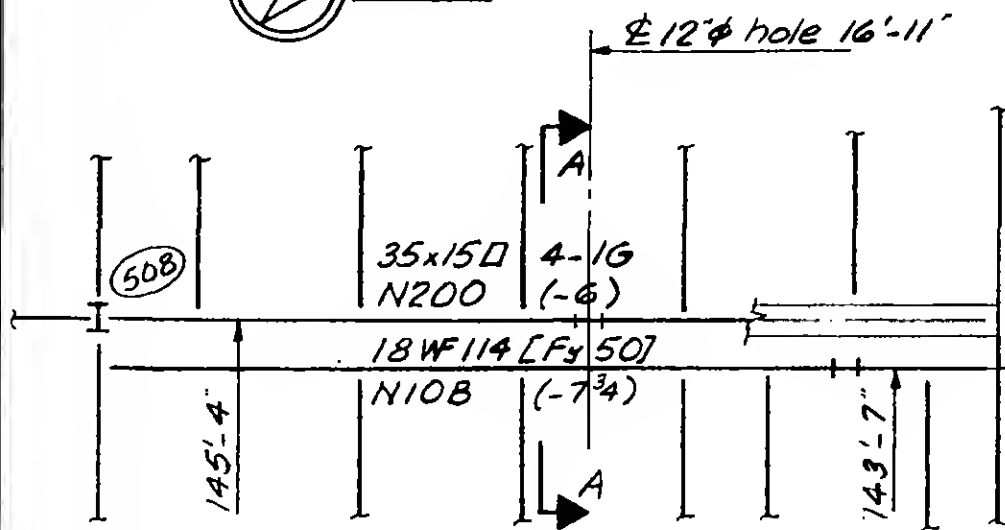
Floor 11

Floor 12

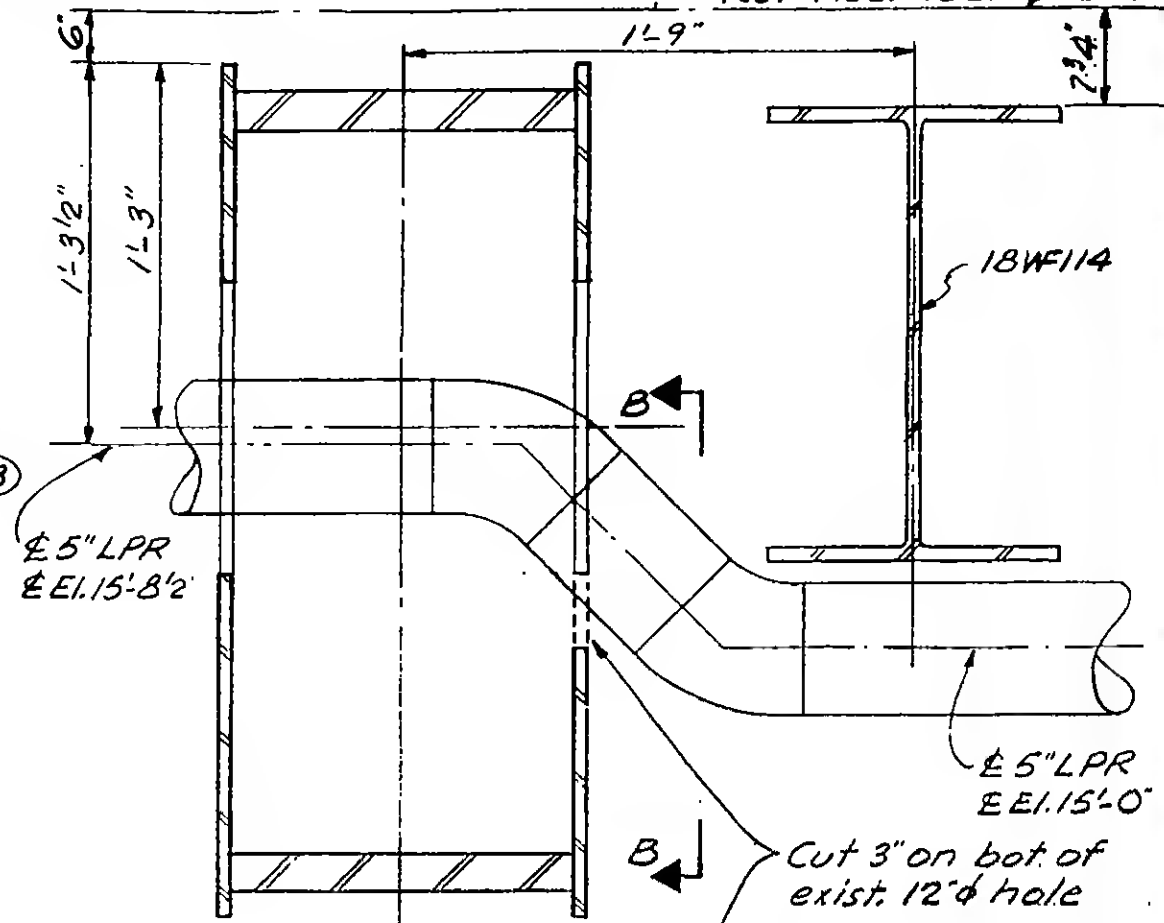
19-B-1106.2

REVISIONS

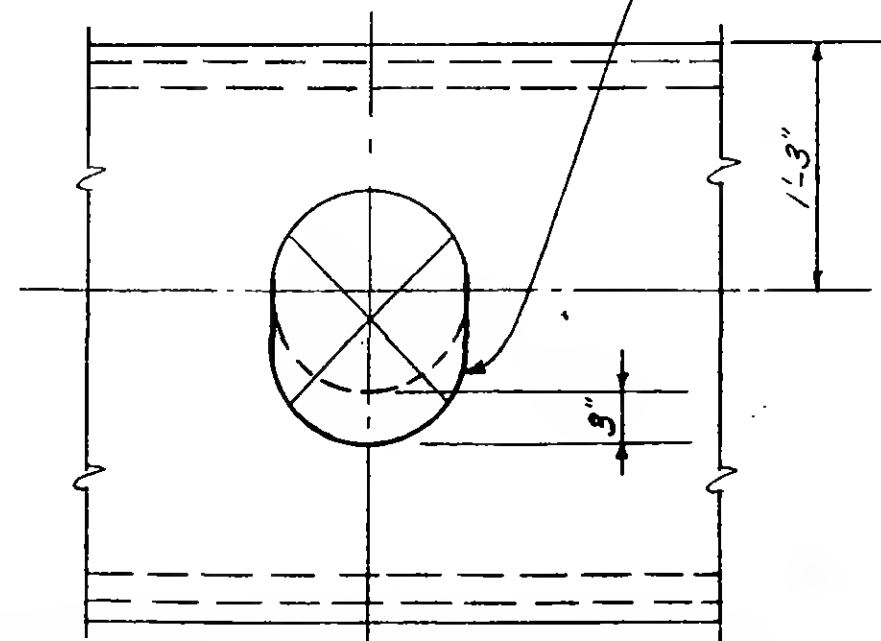
Ref. floor 108



PART PLAN - FLOOR 108



Section A-A



Section B-B



DESIGNED
W. BREWER

DRAWN
A. FRANQUI

REVIEWED
W. Brewer

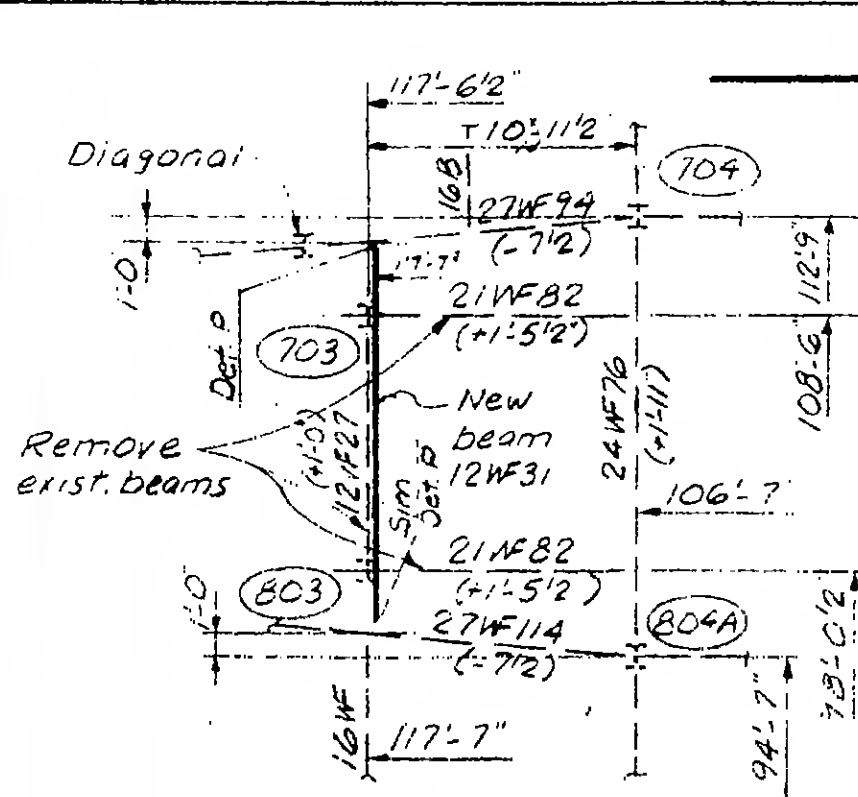
19-B-1107

PROJECT THE WORLD TRADE CENTER

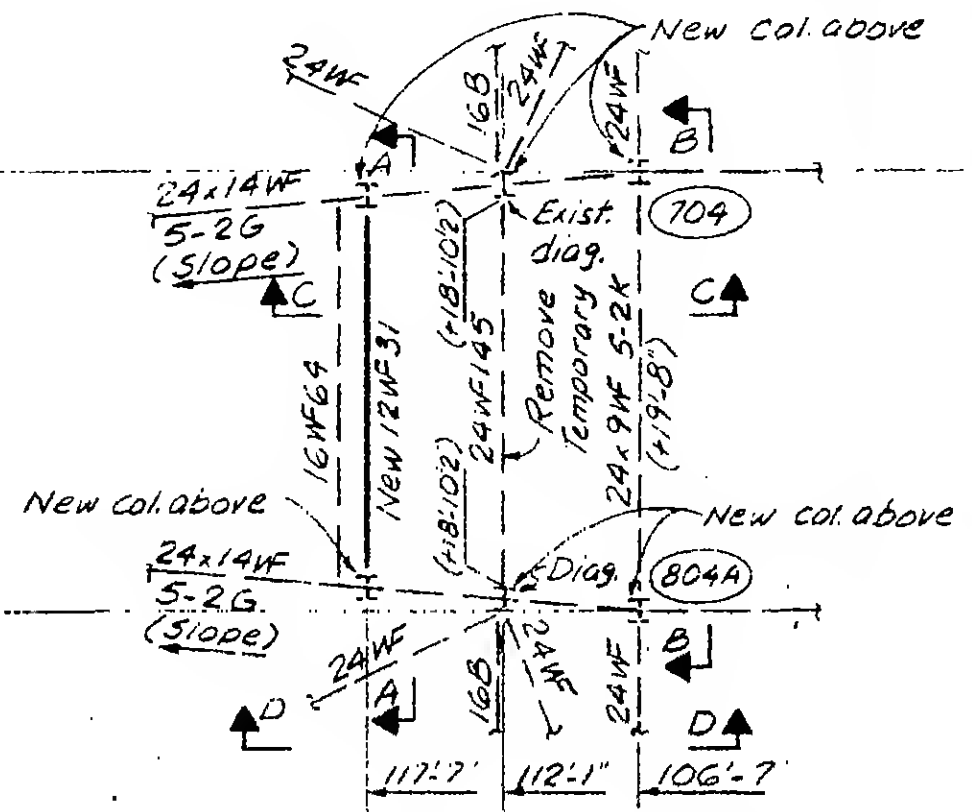
TITLE TOWER B - P.H.-SHAFT 50 EXTENSION

DATE 1-10-72

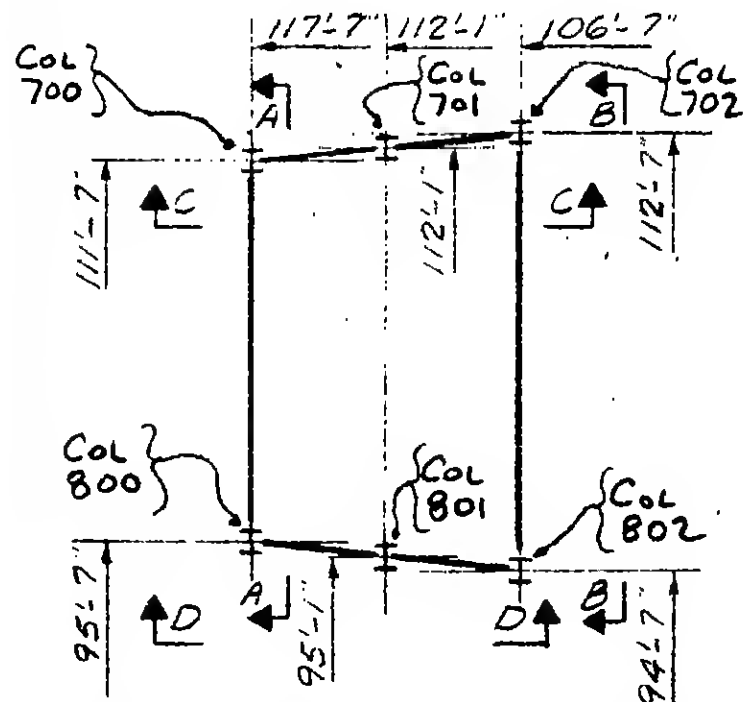
REVISIONS



Plan of 110 Floor



Plan of P.H. Roof

Plan above P.H. Roof
(New Columns)

Notes:

1. All new material shall be A-36 steel.
2. All bolts shall be A-325 Friction Type.
3. All welds shall be E-70xx low hydrogen Electrodes.
4. All new material shall be detailed from field determined dimensions.
5. Remove all new material as indicated on details as directed by the Engineer.
6. All construction to be in accordance with the "Project" specification.

SKILLING - HELLE
CHRISTIANSEN - ROBERTSON
Structural & Civil Engineers
☒ APPROVED
☐ APPROVED AS NOTED
☐ RESUBMIT
☐ REJECTED

Date 3/2/72 By ALR

RECEIVED

FEB 14 1972

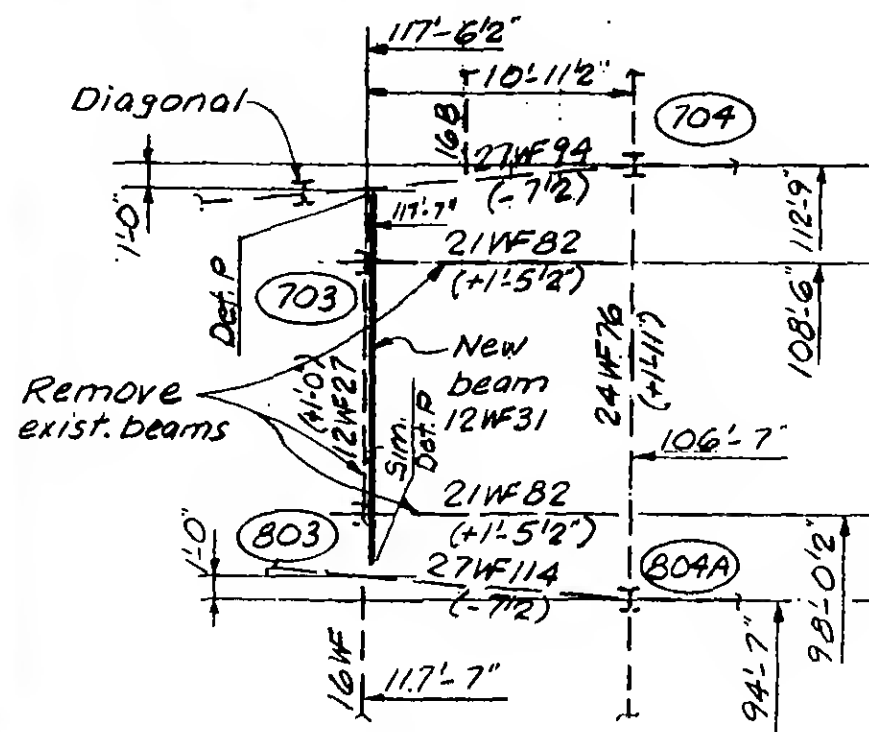
SKILLING - HELLE
CHRISTIANSEN - ROBERTSON
230 PARK AVE. N.Y.C.ERECTION PLAN
E1

19-B-1108.1

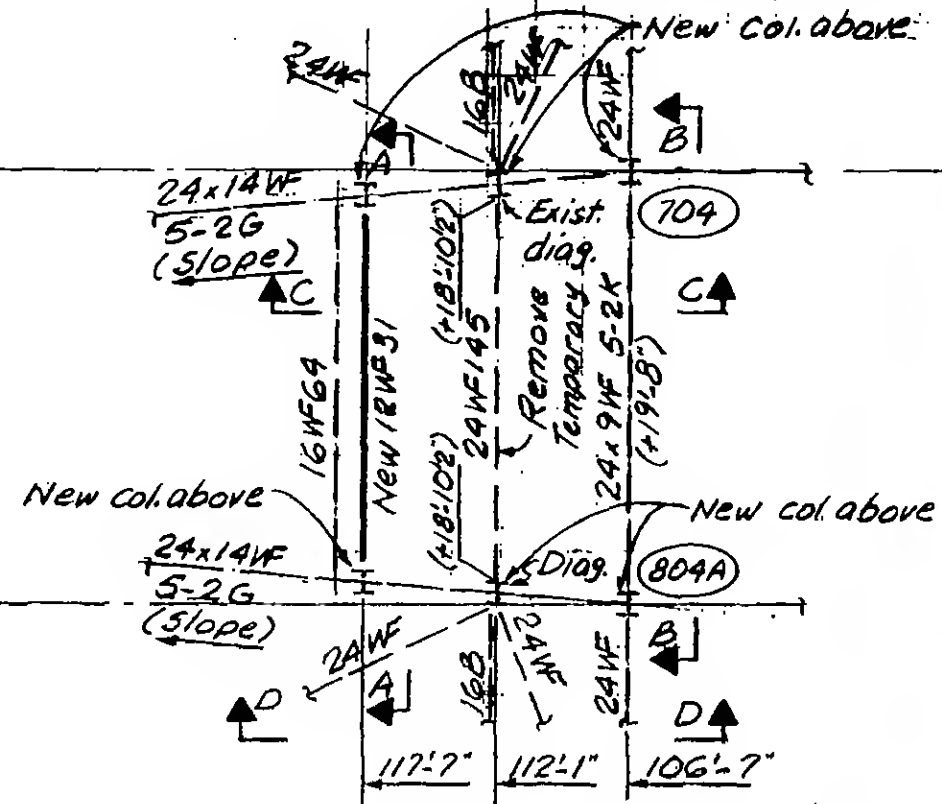
DESIGNED
M. RAMANIDRAWN
A. FRANQUI

REVIEWED

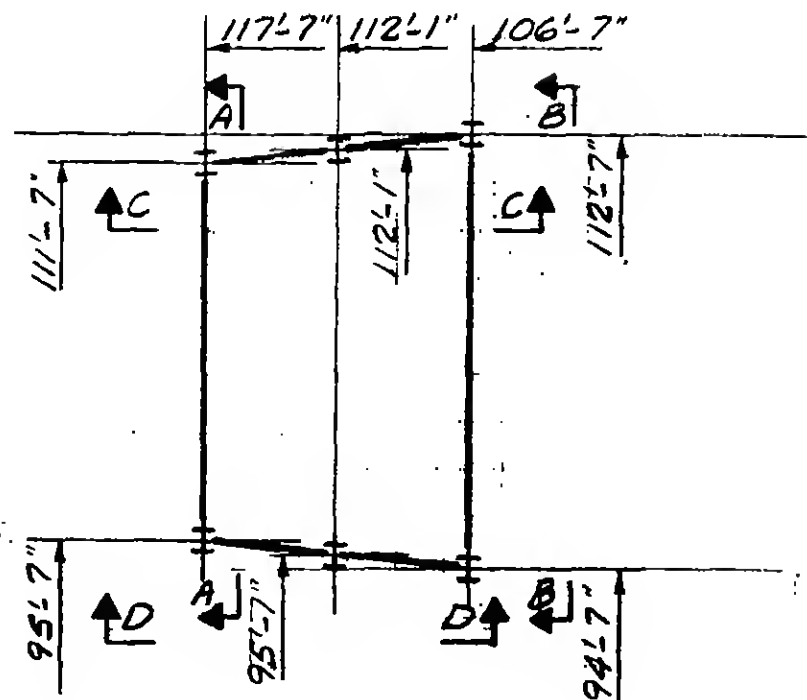
REVISIONS



Plan at 110 Floor



Plan at P.H. Roof



Plan above P.H. Roof

Notes:

1. All new material shall be A-36 steel.
2. All bolts shall be A-325 Friction Type.
3. All welds shall be E-70xx low hydrogen electrodes.
4. All new material shall be detailed from field determined dimensions.
5. Remove all new material as indicated on details as directed by the Engineer.
6. All construction to be in accordance with the "Project" specification.

DESIGNED
M. RAMANIDRAWN
A. FRANQUI

REVIEWED

19-B-1108.1

SKILLING, HELLE, CHRISTIANSEN, ROBERTSON

Structural & Civil Engineers

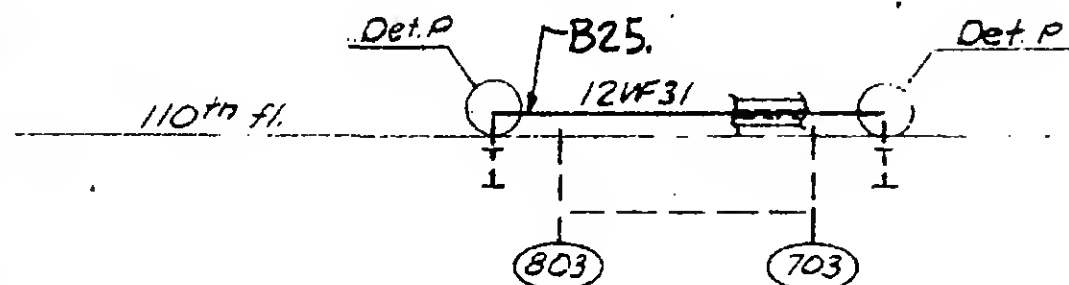
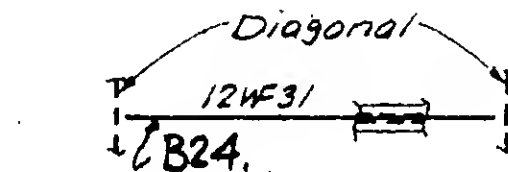
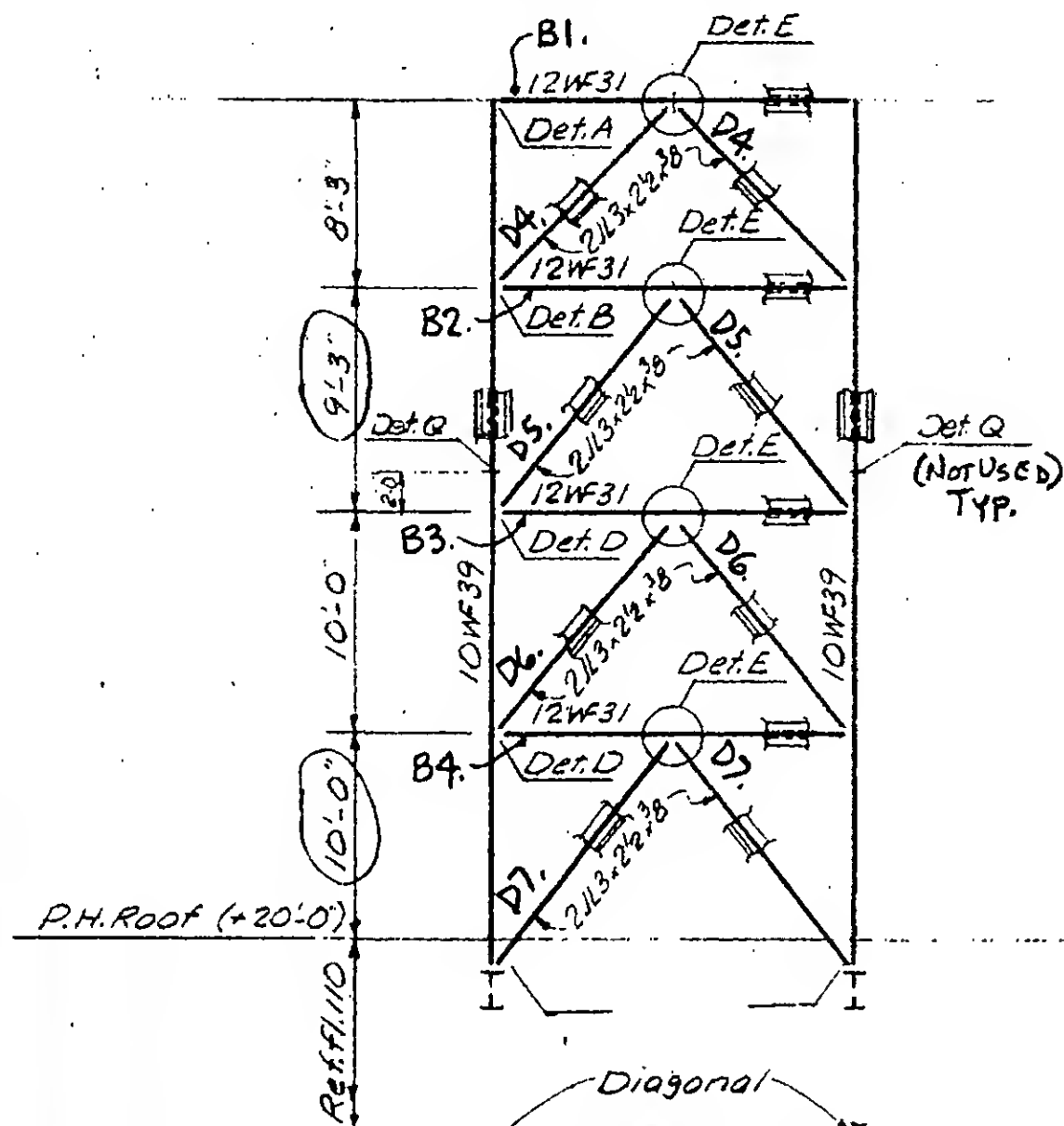
PROJECT THE WORLD TRADE CENTER

TITLE TOWER B-PH-SHAFT 50 EXTENSION

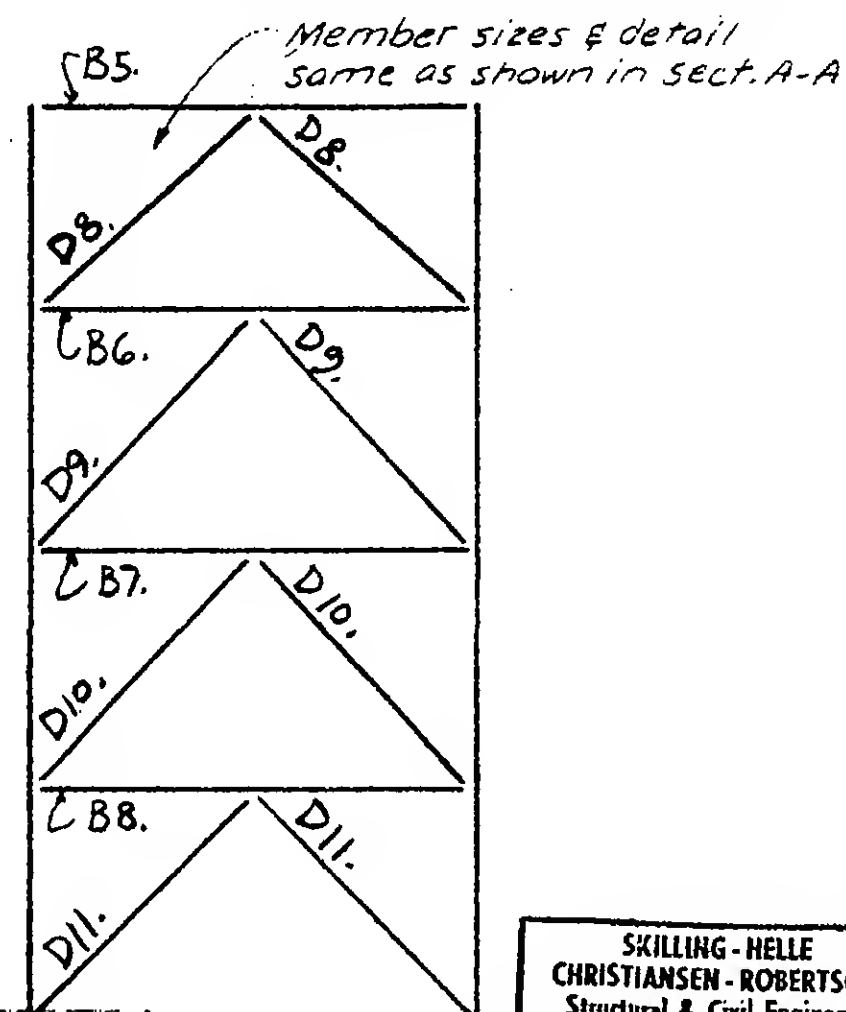
DATE 1-10-72

REVISIONS

R



Section A-A



Section B-B

| | |
|--|-------------------|
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| <input type="checkbox"/> | APPROVED AS NOTED |
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| Date 3/2/72 By ALR | |

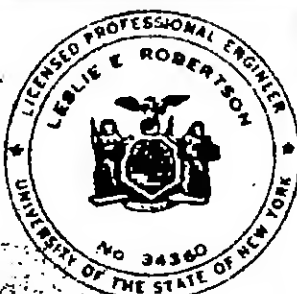
RECEIVED

FEB 11 1972

SKILLING - HELLE
CHRISTIANSEN - ROBERTSON
230 PARK AVE. N.Y.C.

ERECTION PLAN
E2

19-B-1108.2



DESIGNED
M. RAMANI

DRAWN
A. FRANQUI

REVIEWED

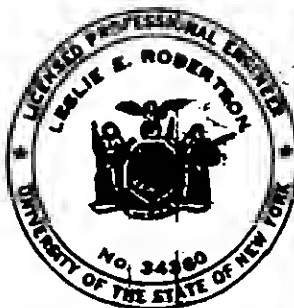
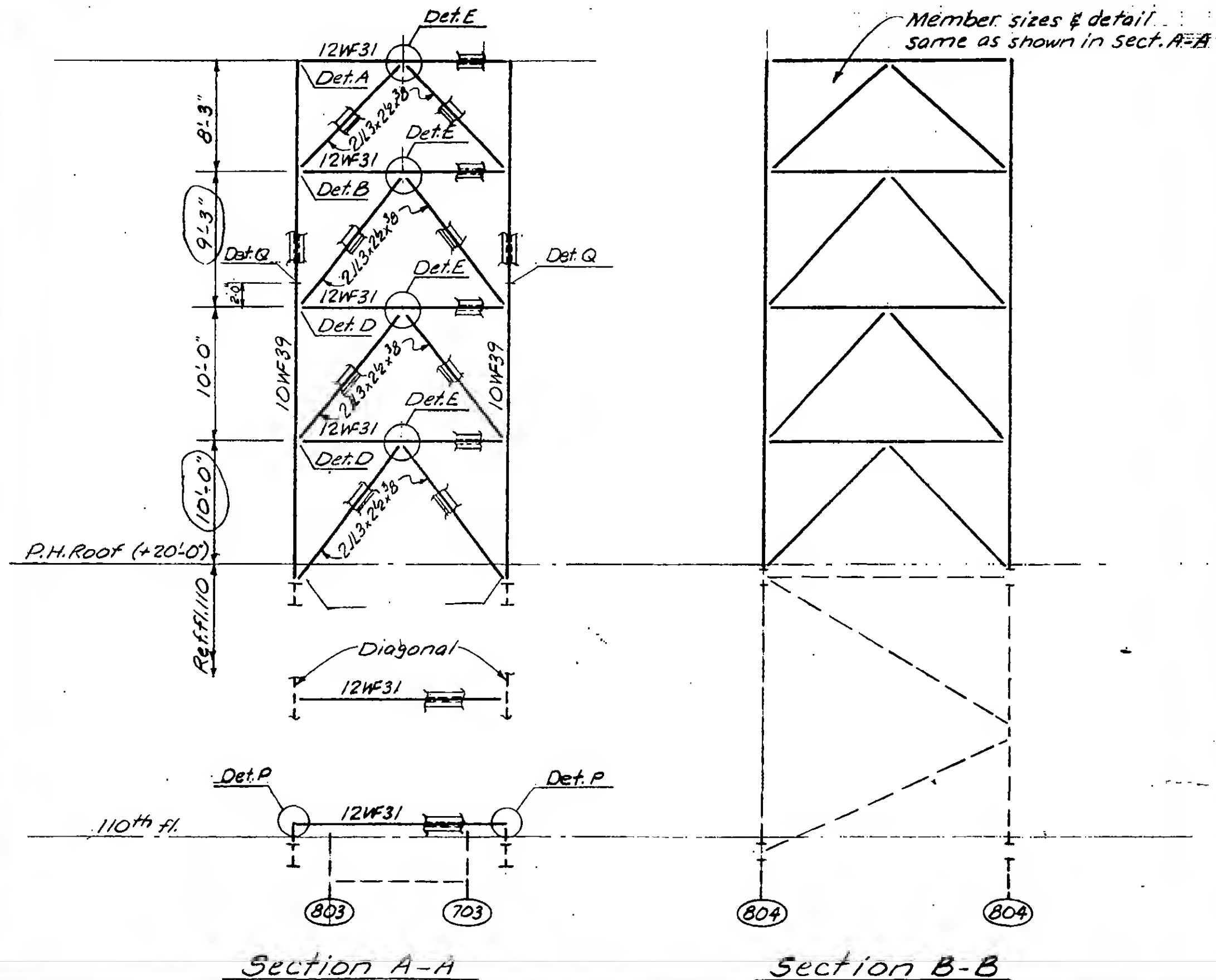
PROJECT THE WORLD TRADE CENTER

TITLE TOWER B-PH-SHAFT 50 EXTENSION

DATE 1-10-72

REVISIONS

R



DESIGNED M. RABIANI

DRAWN A. FRANQUI

REVIEWED

19-B-1108.2

PROJECT

THE WORLD TRADE CENTER

TITLE

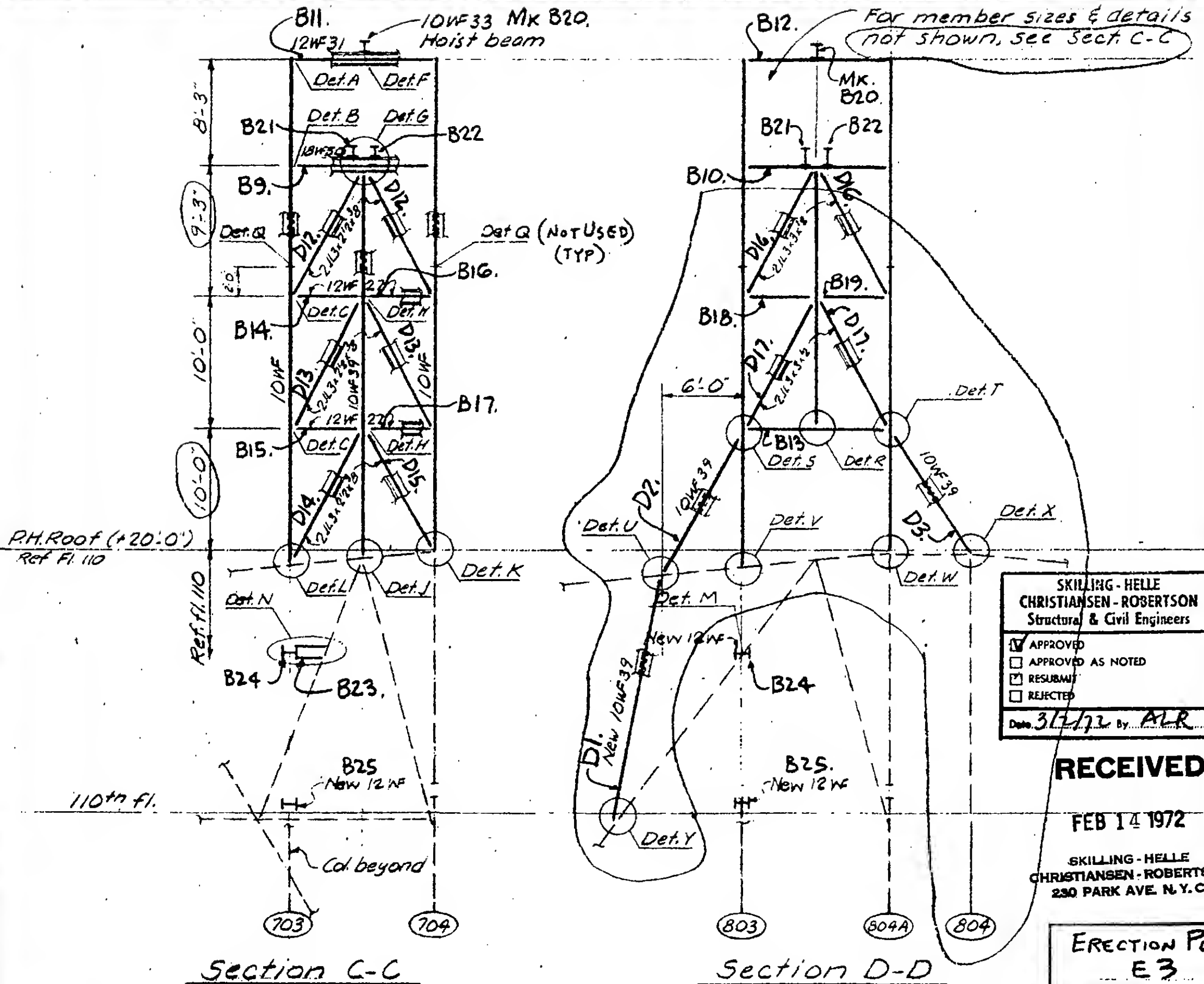
TOWER B-PH-SHAFT 50 EXTENSION

DATE

1-10-72.

REVISIONS

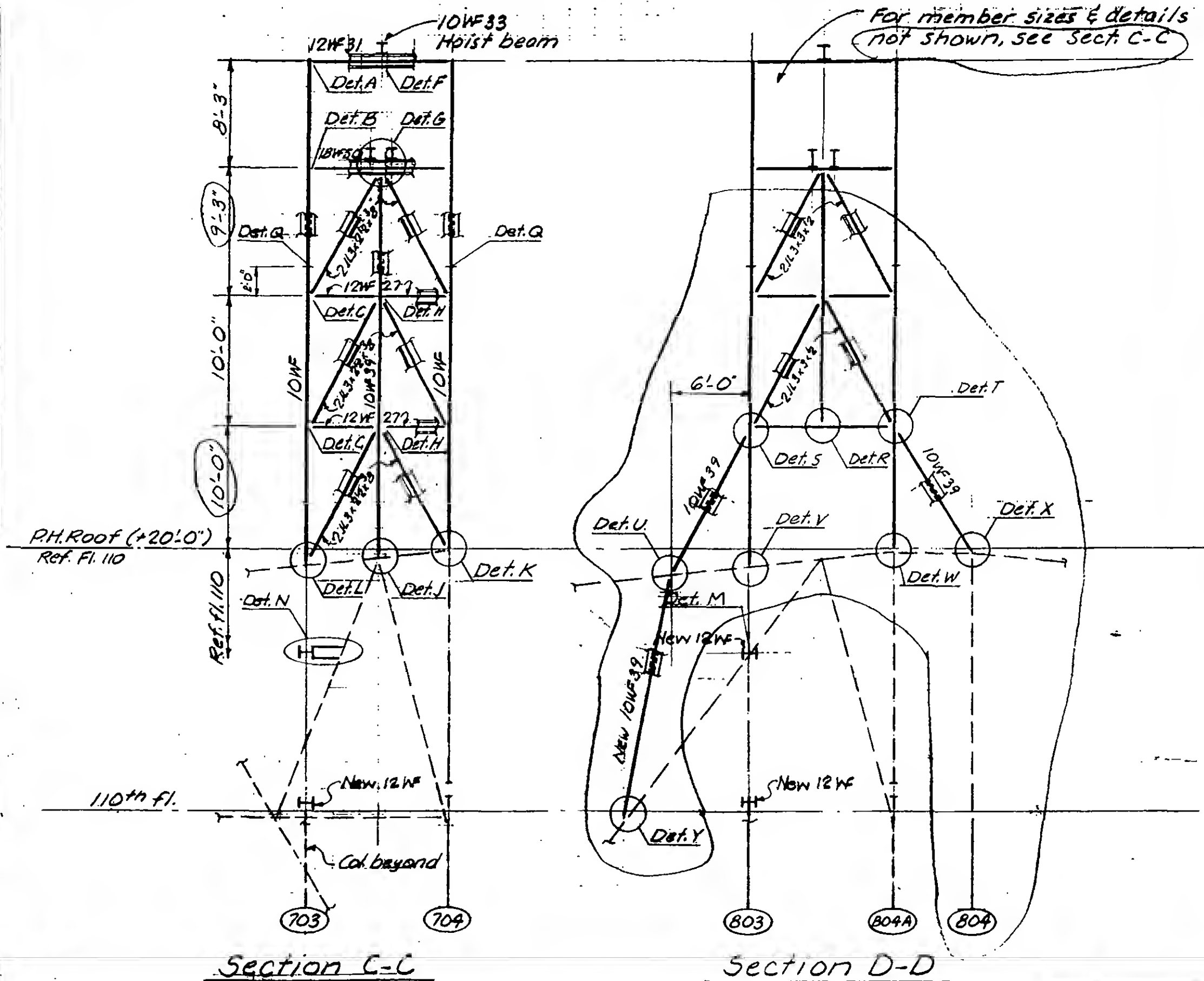
R

DESIGNED
BY RAMANIDRAWN
BY FRANQUI

CHECKED

REVISIONS

R



DESIGNED,
M. RAMANI

DRAWN
A. FRANQUI

REVIEWED

19-B-1108.3

PROJECT

THE WORLD TRADE CENTER

TITLE

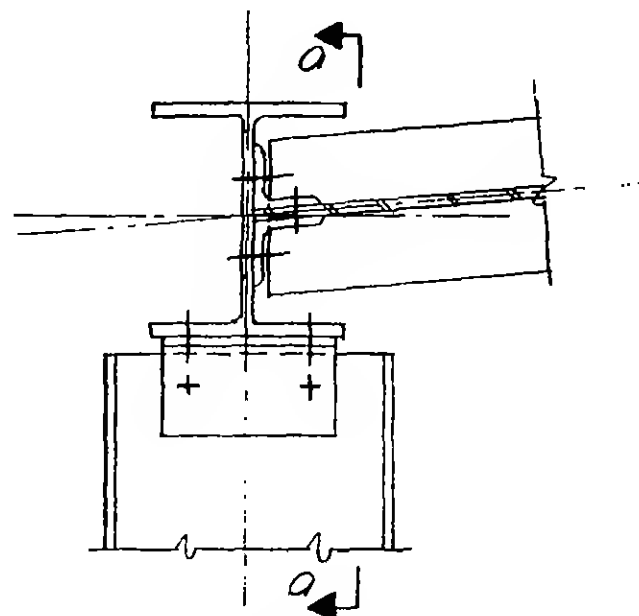
TOWER B-P.H.-SHAFT 50 EXTENSION

DATE

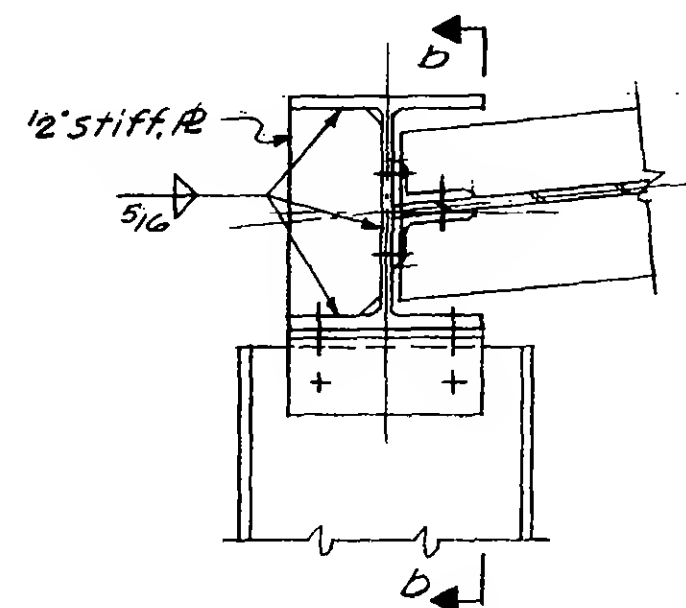
1-10-72

REVISIONS

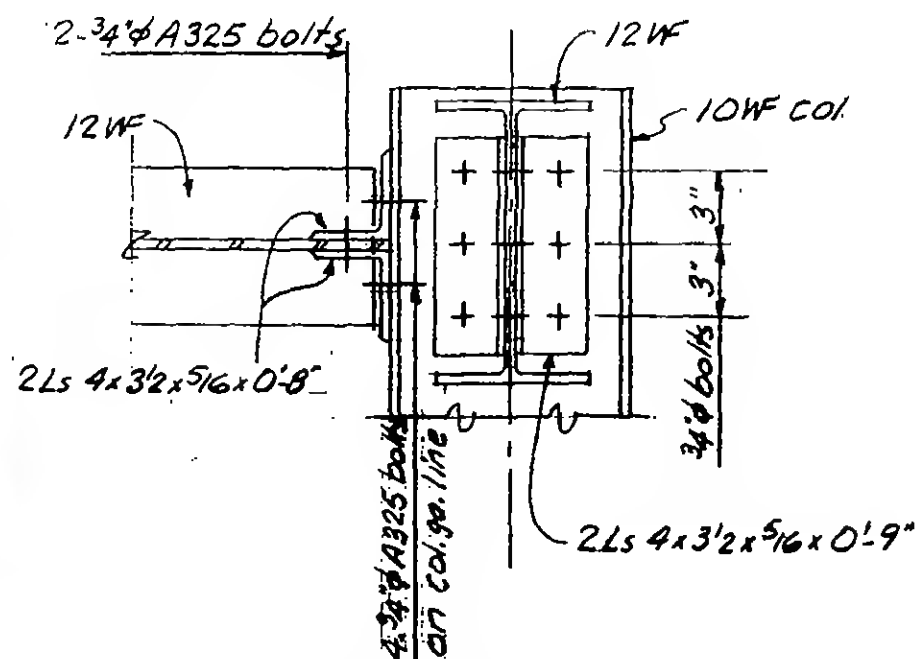
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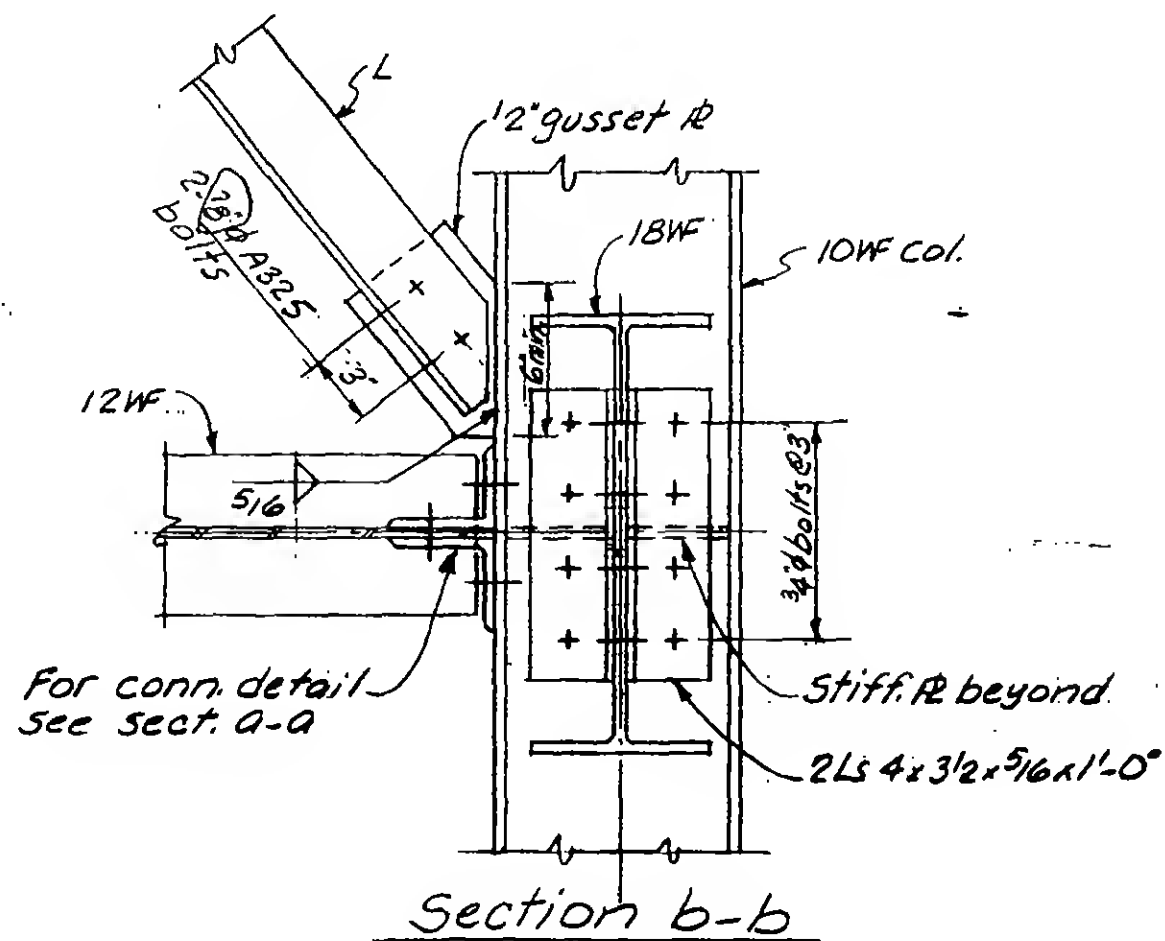
Detail A



Detail B



Section A-A



Section B-B

DESIGNED
M. RAMANIDRAWN
A. FRANQUI

REVIEWED

19-B-1108.4

PROJECT

THE WORLD TRADE CENTER

TITLE

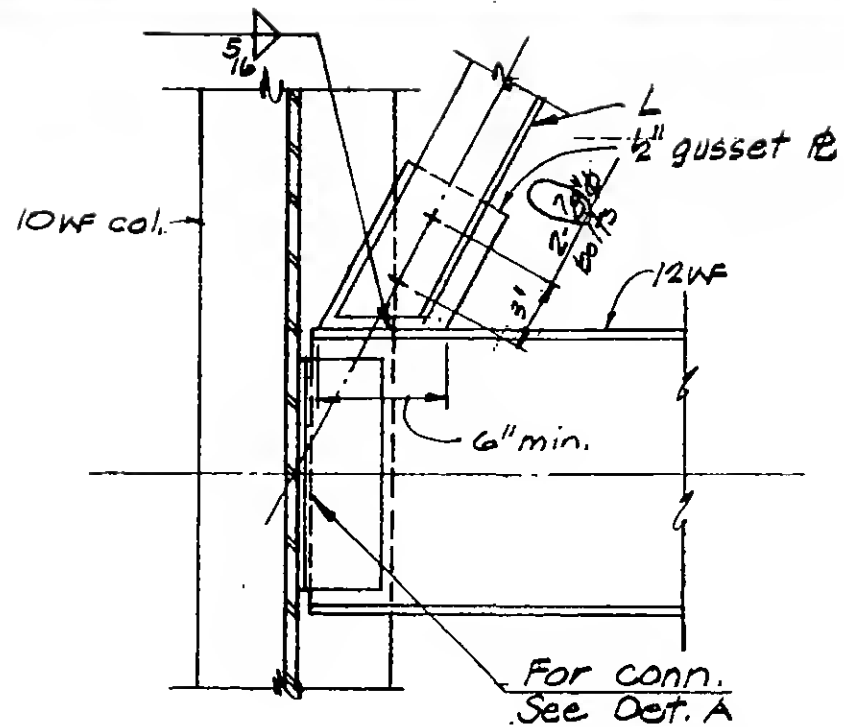
TOWER B-PH-SHAFT 50 EXTENSION

DATE

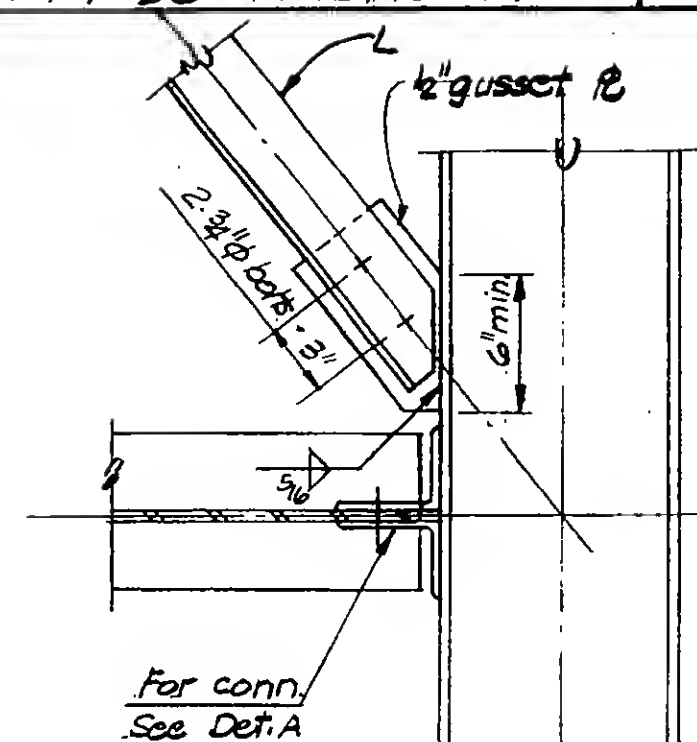
7-10-72

REVISIONS

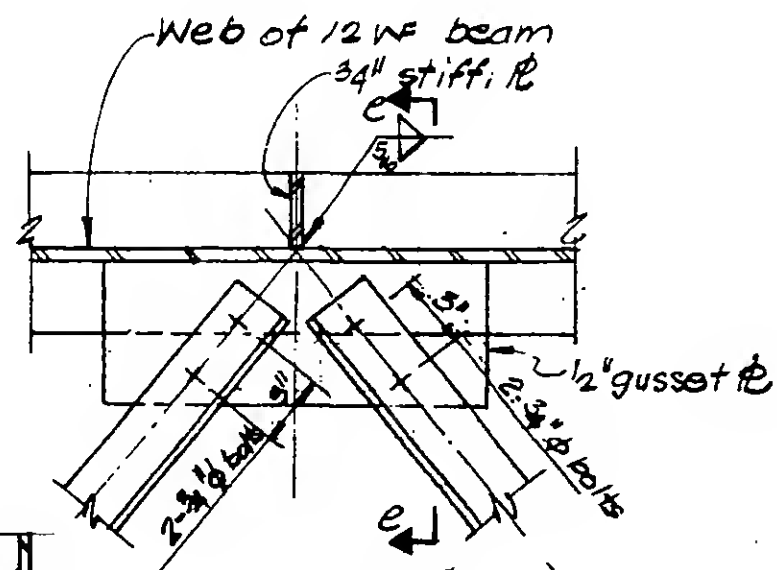
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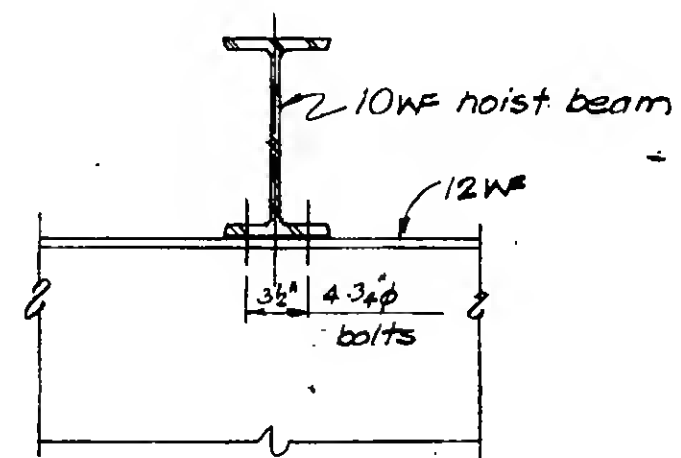
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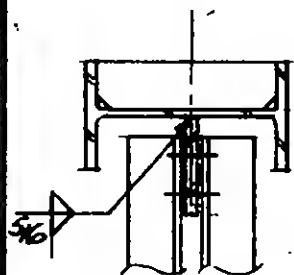
Detail D



Detail E



Detail F



Section e-e

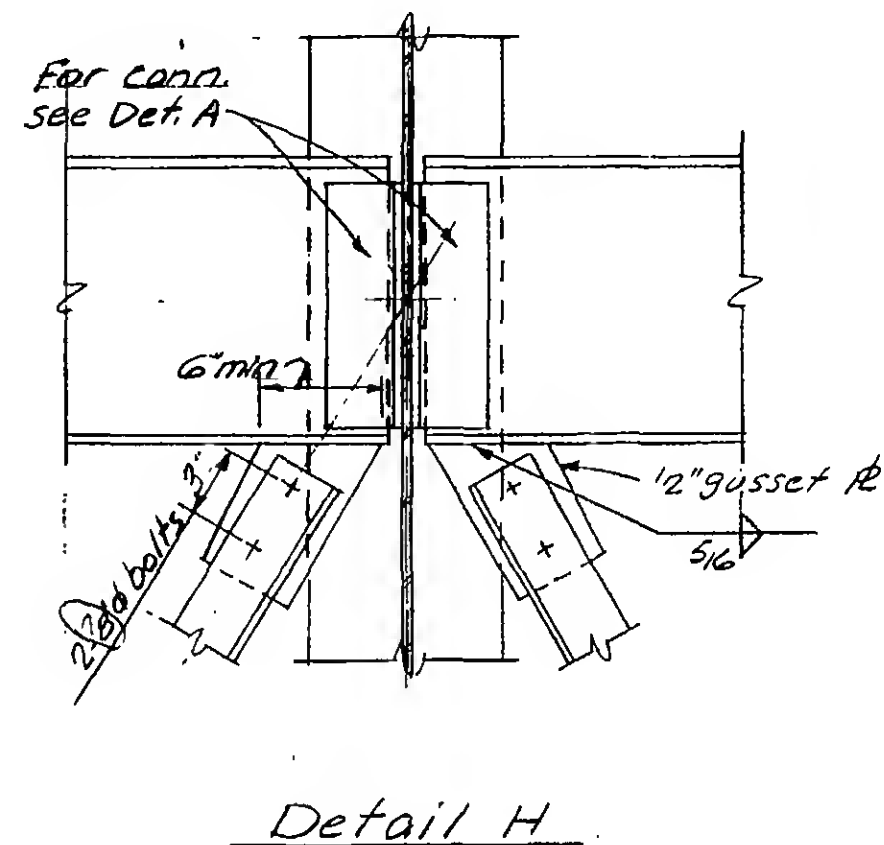
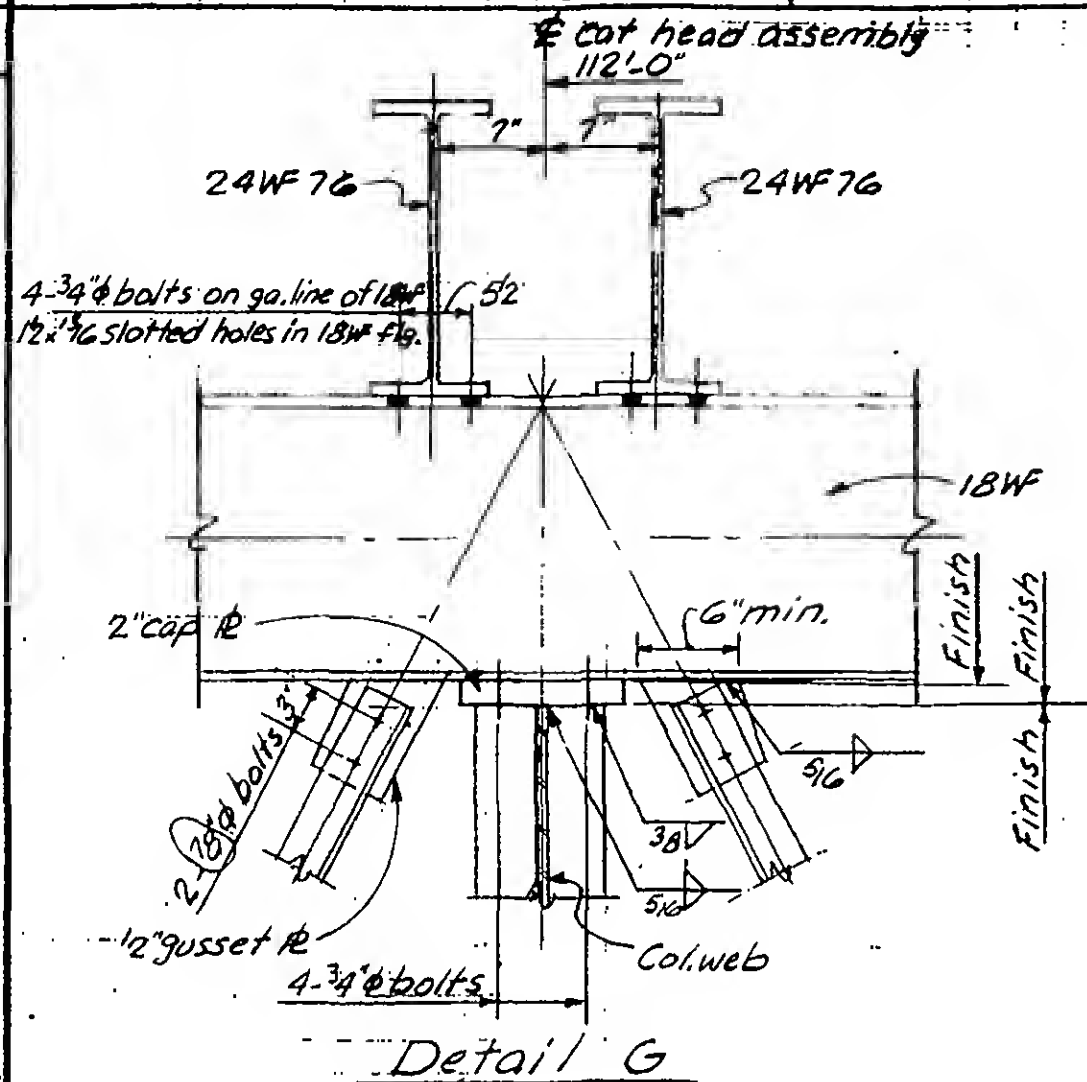
DESIGNED
M. RomanDRAWN
P.M. Ozeki

REVIEWED

19-B-1108.B

REVISIONS

R



DESIGNED
M. RAMANI

DRAWN
A. FRANQUI

REVIEWED

19-B-1108.6

SKILLING, HELLE, CHRISTIANSEN, ROBERTSON

Engineers

PROJECT

THE WORLD TRADE CENTER

TITLE

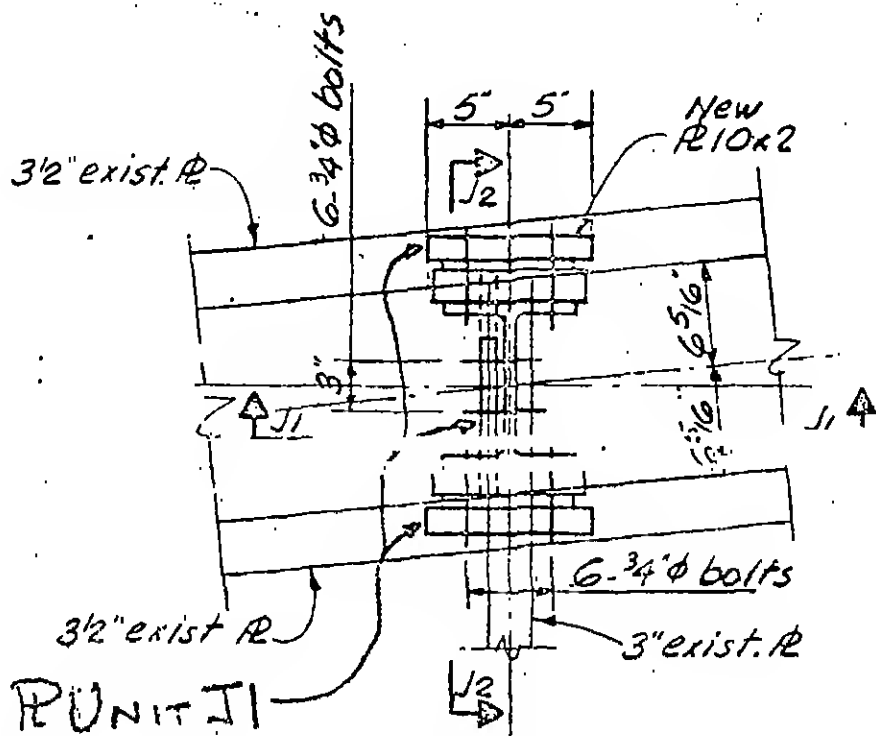
TOWER

EXTENSION

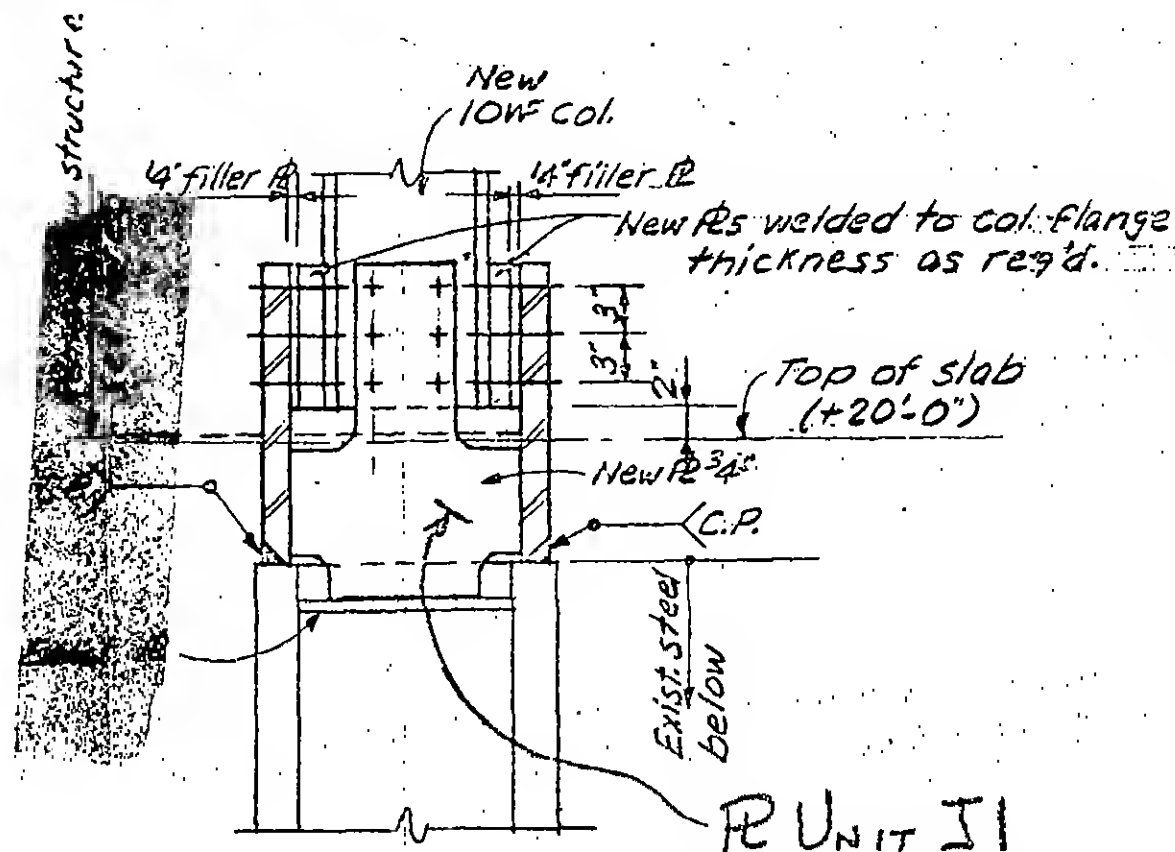
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1-10-72

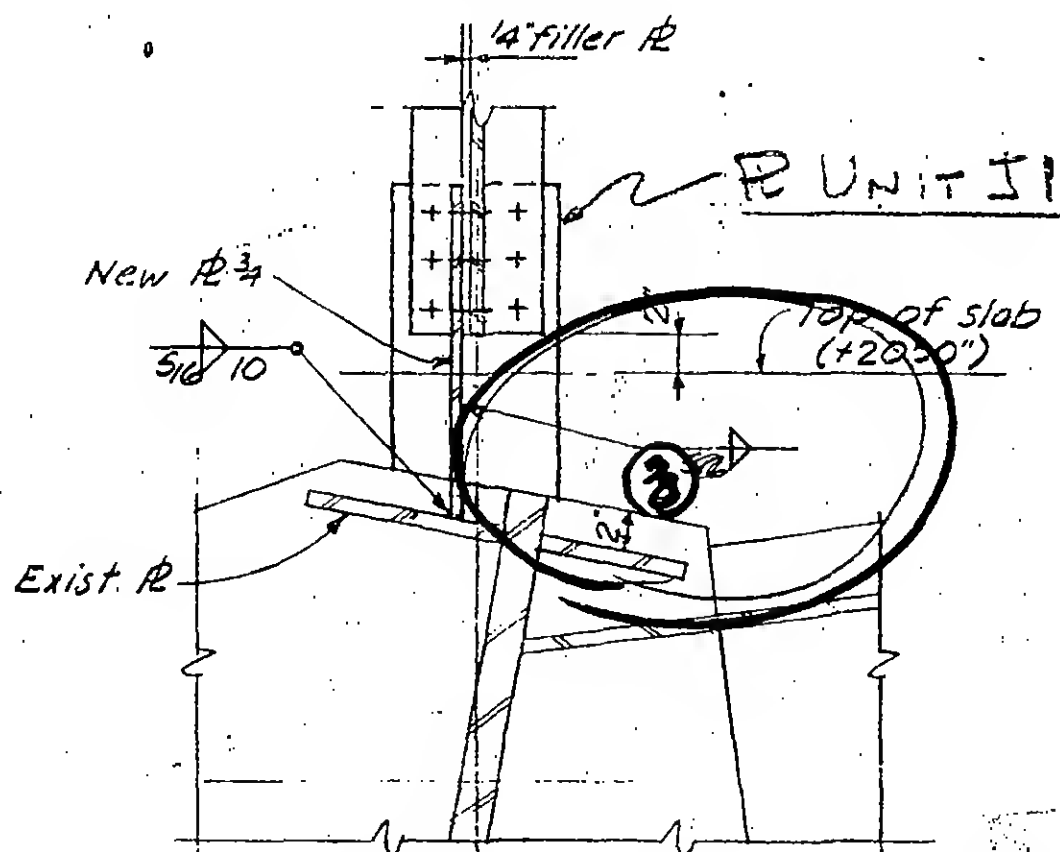
REVISIONS



Detail J



Section J2-J2



Section J1-J1

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|--|---------------------|
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| <input type="checkbox"/> | REJECTED |
| Date | 3/6/72 By ALR |

19B.1100.7

ERECTION PLAN
E4



DESIGNED
M. RAMANI

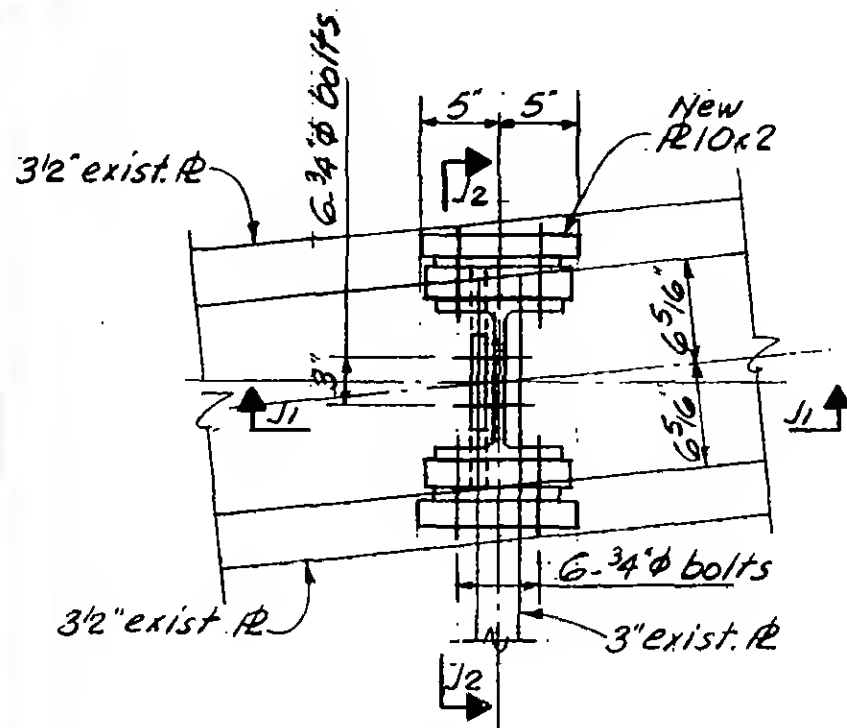
CHECKED
A. ROBINSON

PROJECT THE WORLD TRADE CENTER

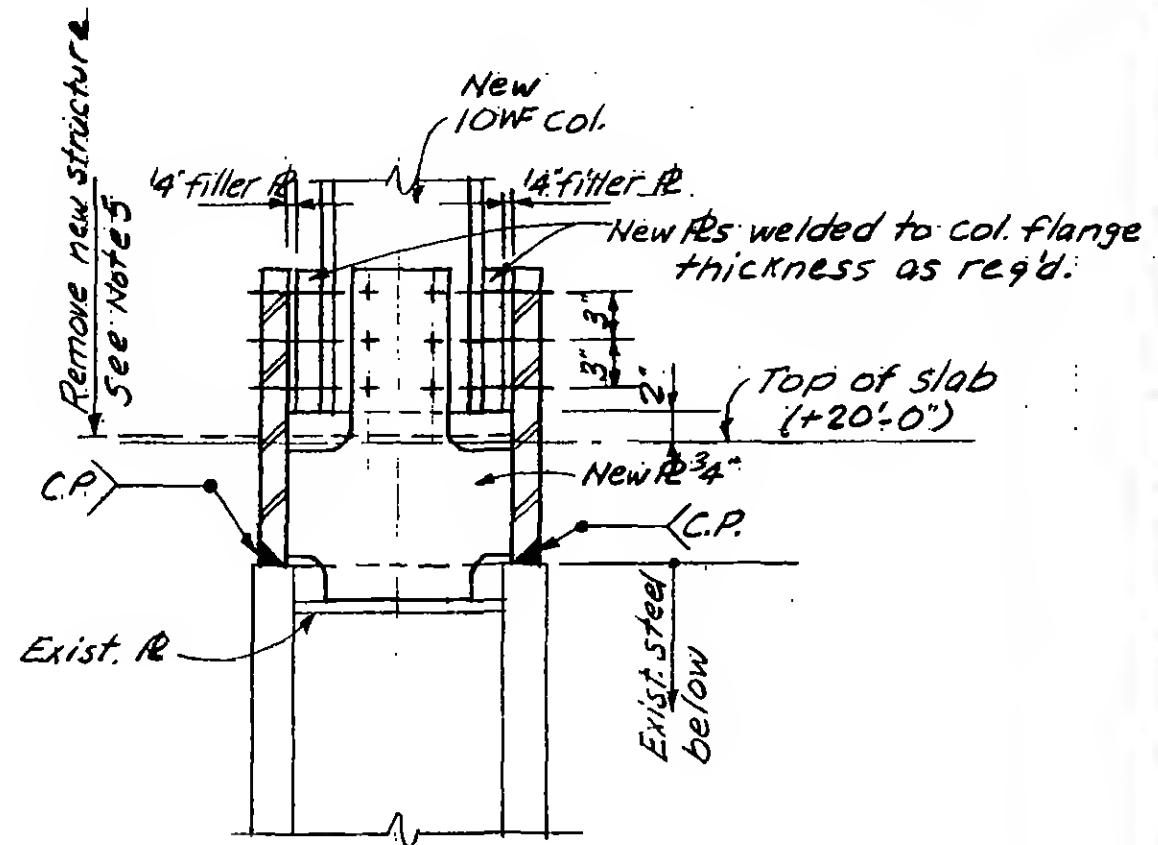
TITLE TOWER B-P.H-SHAFT 50 EXTENSION

DATE 1-10-72

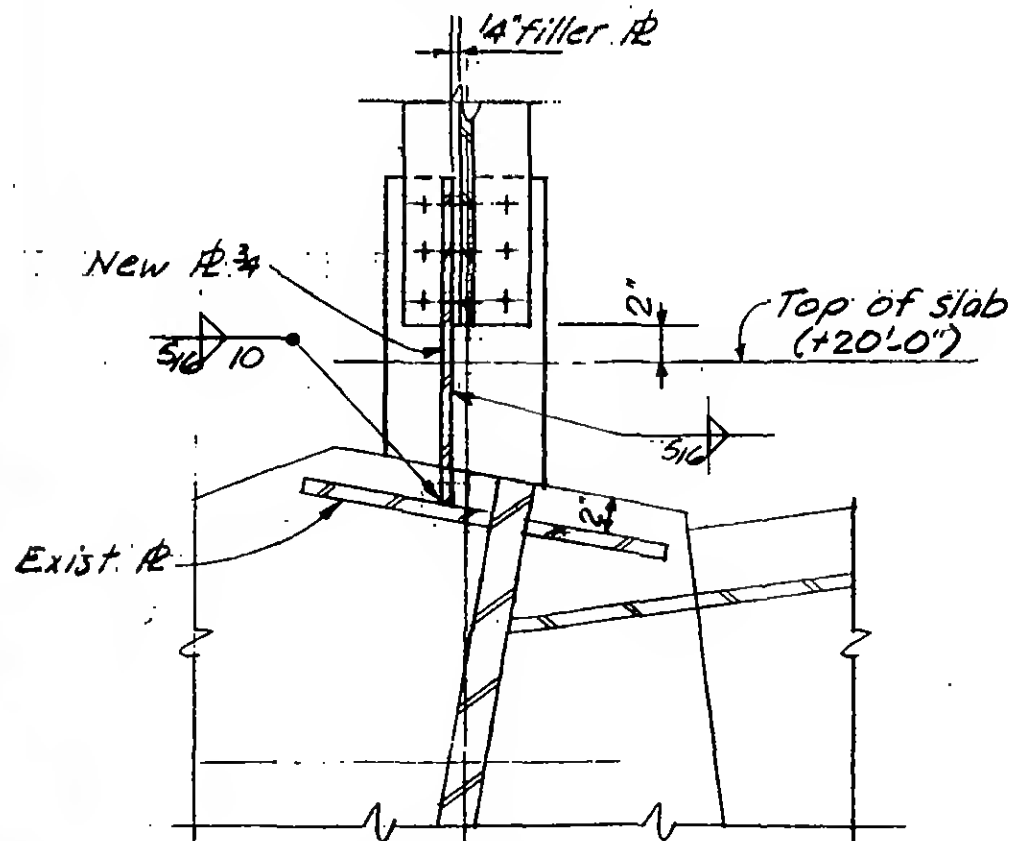
REVISIONS



Detail J



Section J2-J2



Section J1-J1

DESIGNED:
M. RAMANIDRAWN
A. FRANQUI

REVIEWED

19-B-1108.7

SKILLING, HELLE, CHRISTIANSEN, ROBERTSON

PROJECT

THE WORLD TRADE CENTER

TITLE

TOWER

Engineers

100 EXTENSION

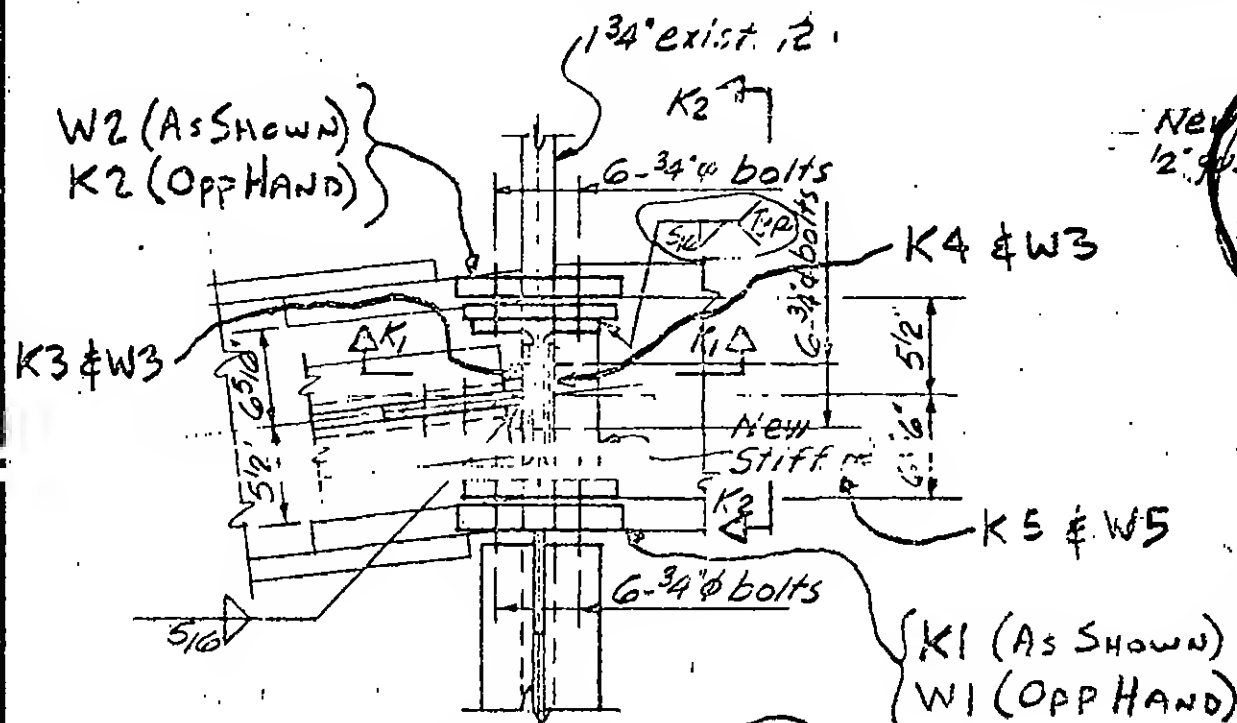
DATE

1-10-72

REVISIONS

R

W2 (As Shown)
K2 (Opp Hand)



Detail K & W
Detail W opp. hand

Only at
Det. K

New
1/2\"/>

New
1/4\"/>

2Ls

2-3/4\"/>

New
3/4\"/>

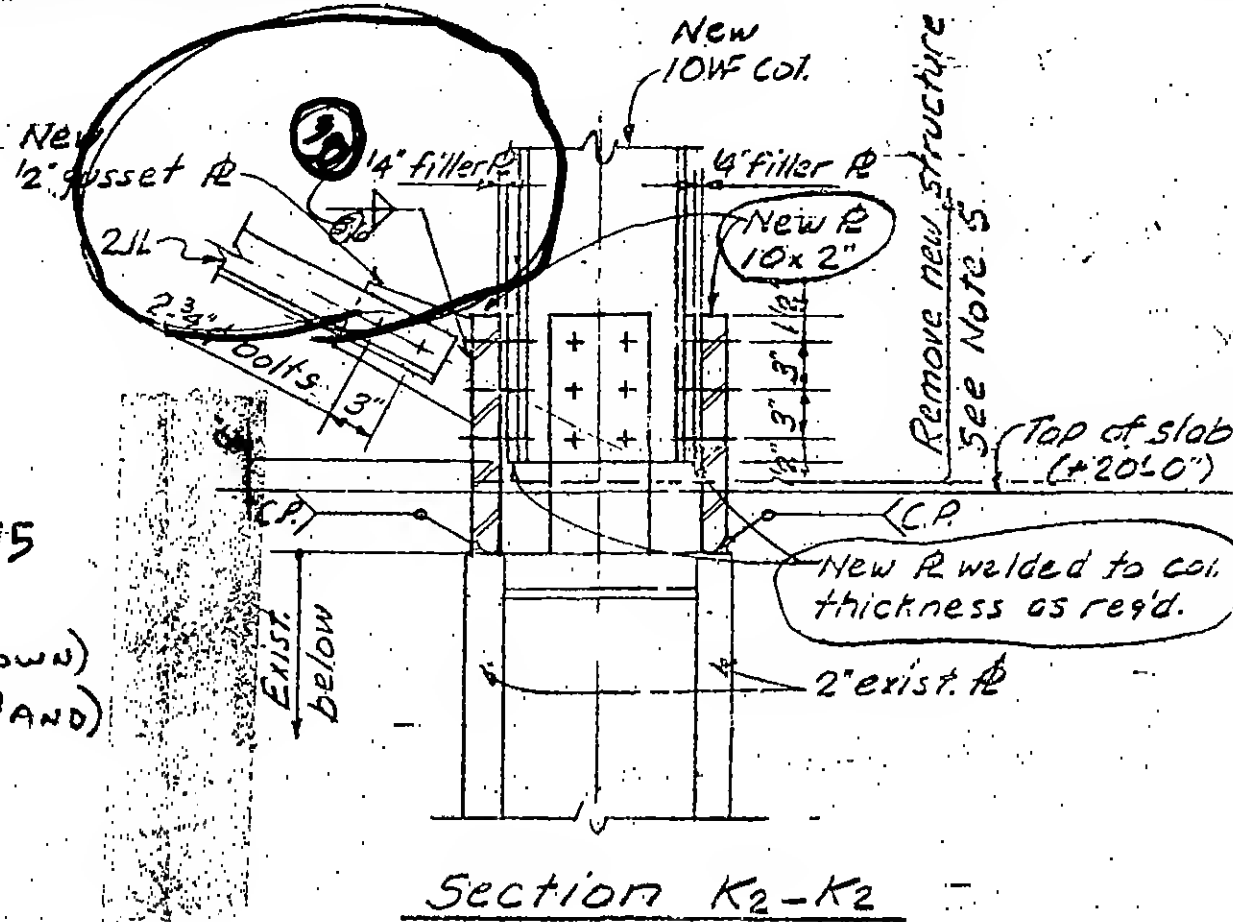
New
R 6x7 1/2 x 1 1/2\"/>

Remove new structure
See Note 5

Top of slab

C.P.

Section K1-K1



Section K2-K2

Remove new structure
See Note 5

New R welded to col.
thickness as req'd.

2\"/>

EXIST.
below

| | |
|--|-------------------|
| SKILLING - HELLE CHRISTIANSEN - ROBERTSON Structural & Civil Engineers | |
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| <input type="checkbox"/> | REJECTED |
| Date | 3/6/72 By ALR |

19-B-1108.8

ERECTION PLAN



DESIGNED
M. RAMANI

DRAWN

PROJECT

THE WORLD TRADE CENTER

TITLE

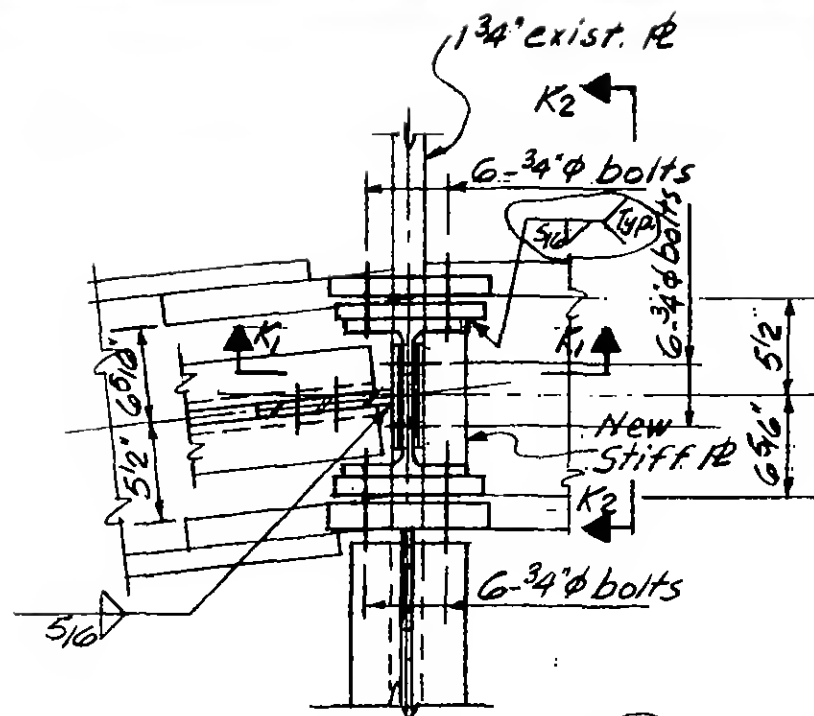
TOWER B-R.H-SHAFT 50 EXTENSION

DATE

1-10-72

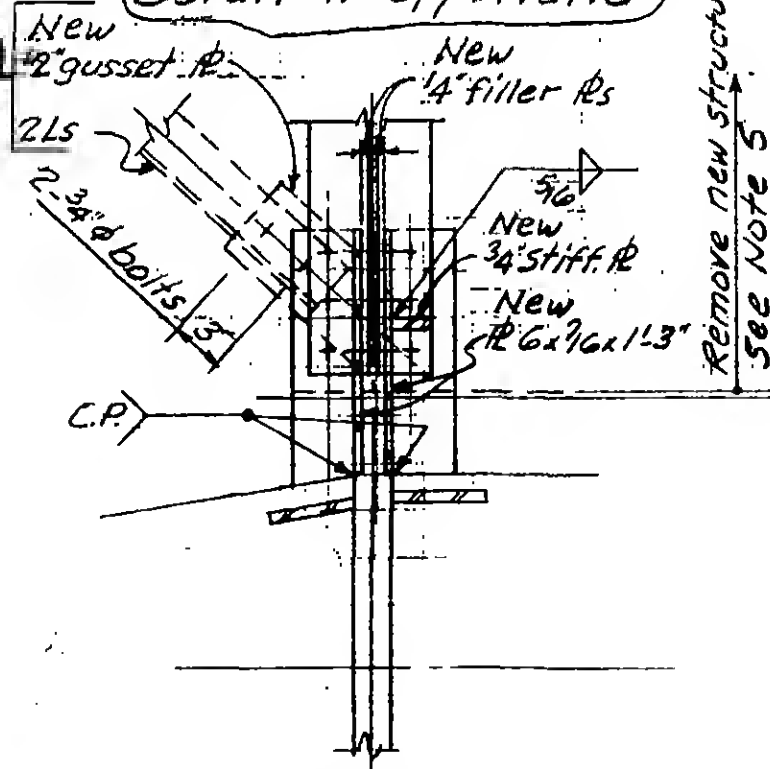
REVISIONS

R

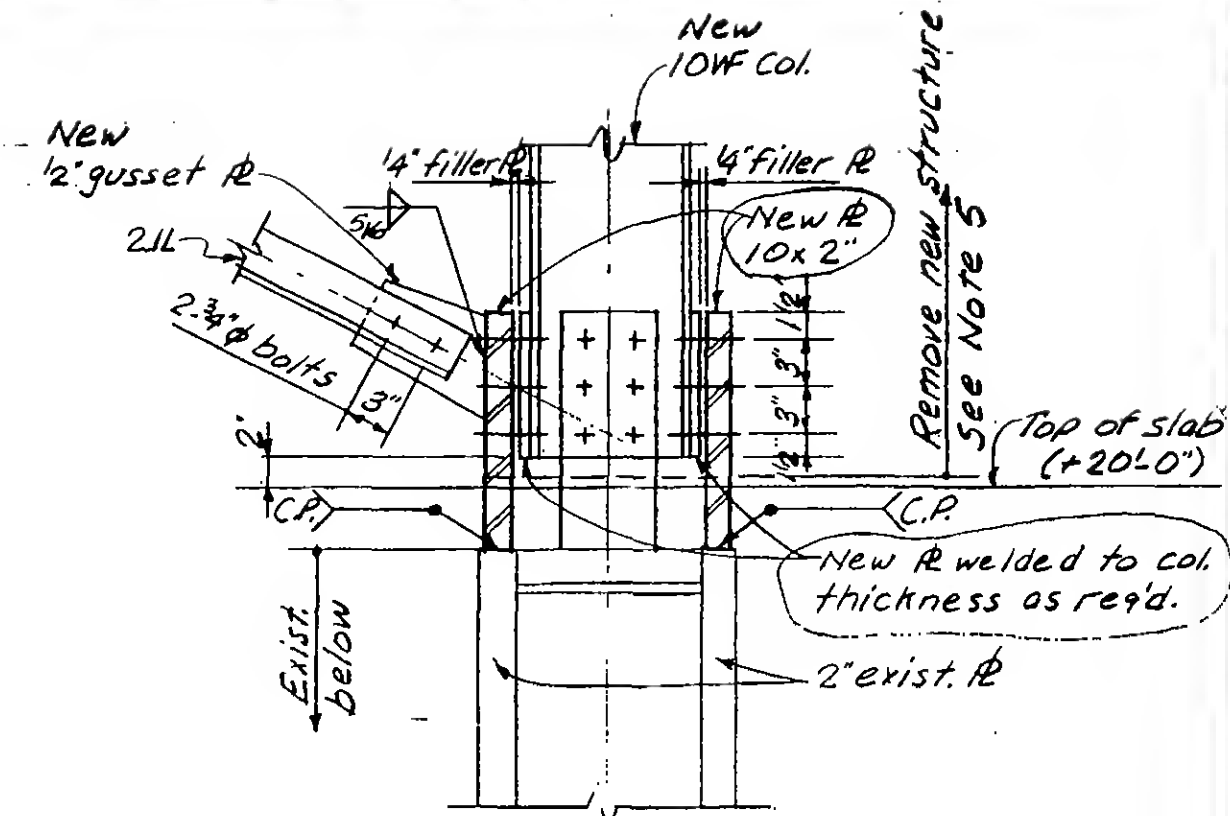


Detail K & W
Detail W opp. hand

Only at Det. K



Section K1-K1



Section K2-K2

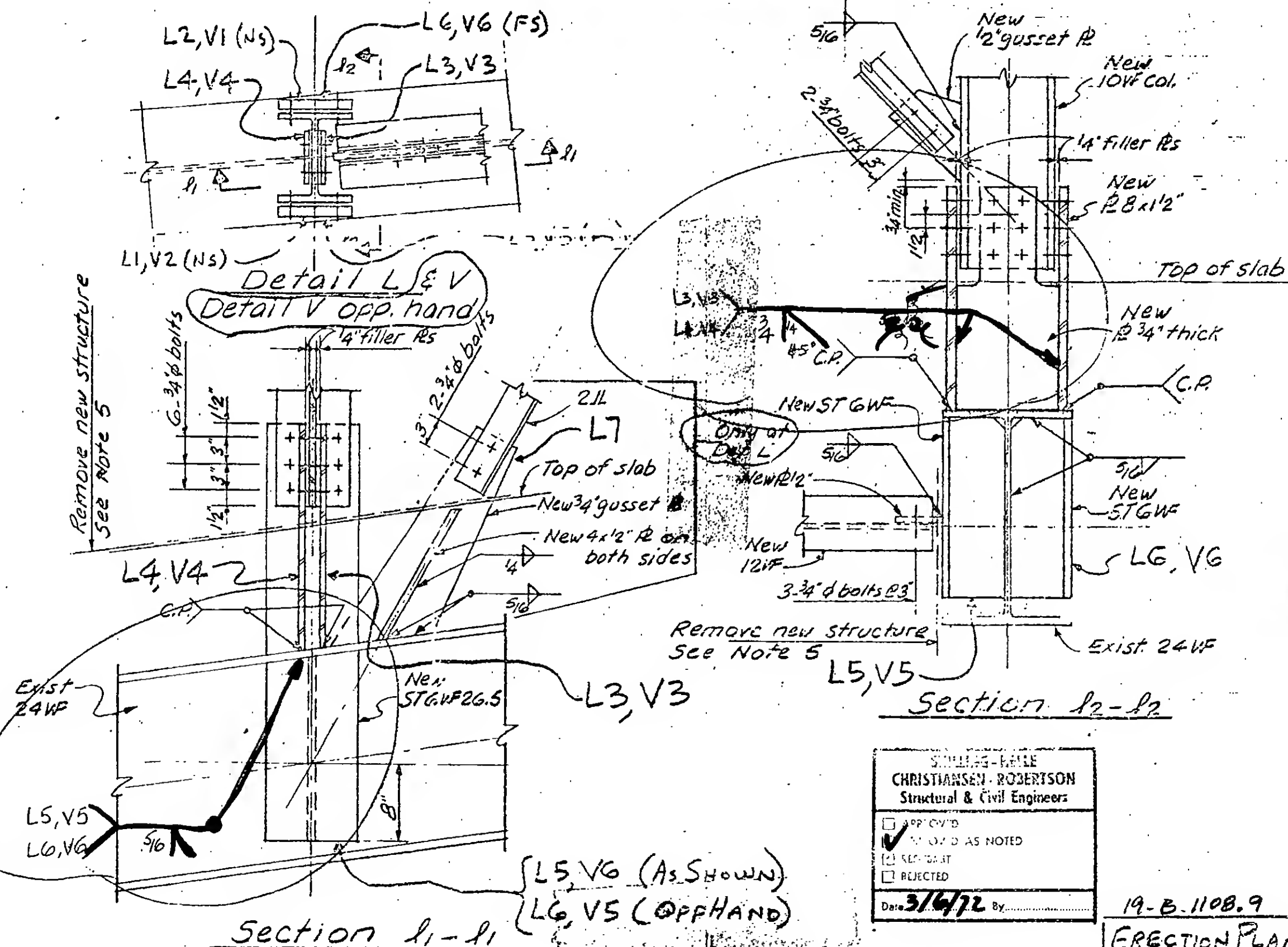
DESIGNED
M. RAMANIDRAWN
A. ERANDUI

REVIEWED

19-B-1108.8

REVISIONS

R



DESIGNED
M. RAMANI

ORIGIN
A. FRANZU

**SHILLING-LEE
CHRISTIANSEN-ROBERTSON**
Structural & Civil Engineers

☐ APPROVED
☒ APPROVED AS NOTED
☐ RE-ESTIMATE
☐ REJECTED

Date 3/6/72

19-B-1108.9

ERECTION PLAN
EG

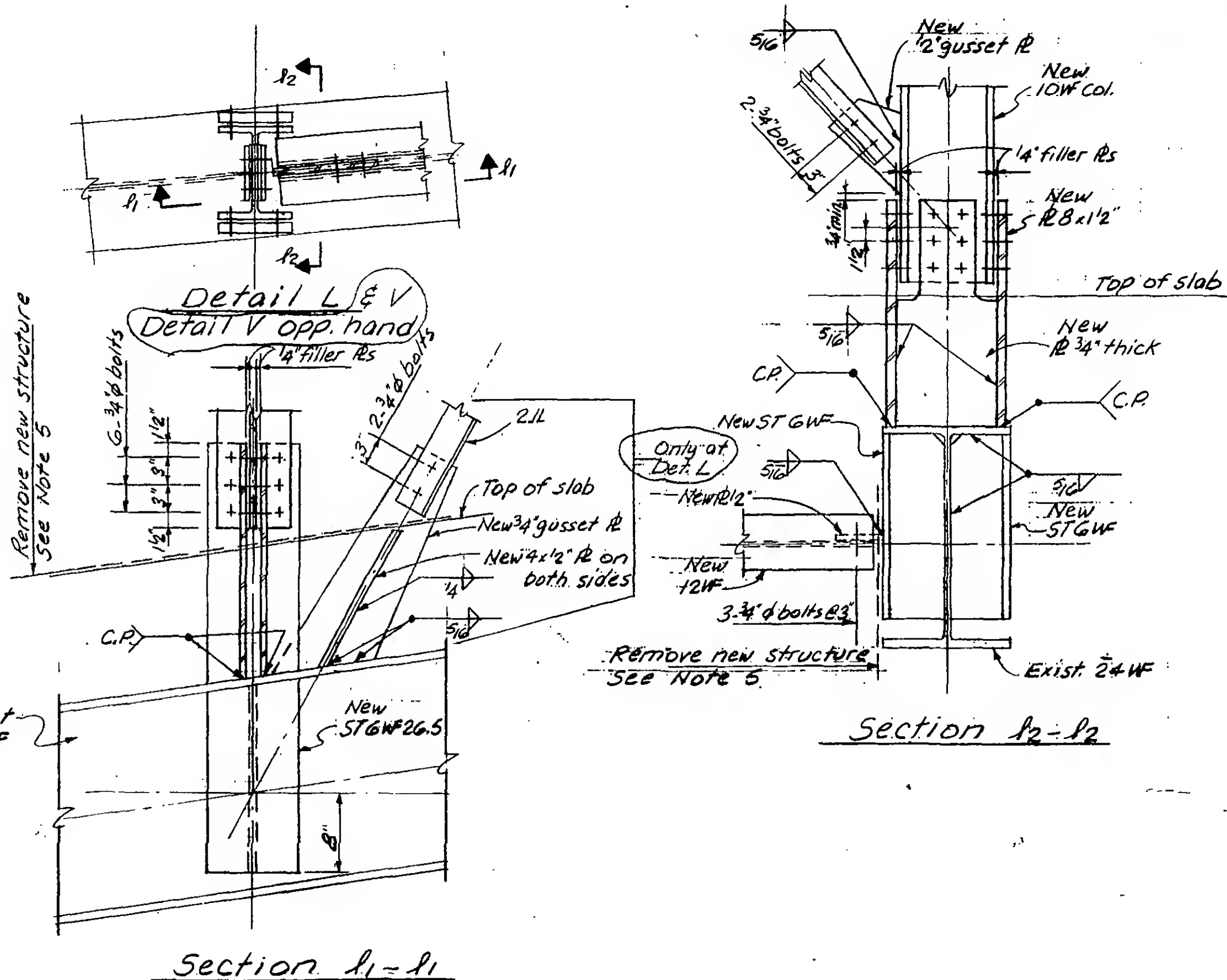
PROJECT THE WORLD TRADE CENTER

TITLE TOWER B - P.H. - SHAFT 50 EXTENSION

DATE 1-10-72

REVISIONS

R

DESIGNED
M. RAMANIDRAWN
A. FRANQUI

REVIEWED

19-B-1108.9

SKILLING, HELLE, CHRISTIANSEN, ROBERTSON

Engineers

PROJECT

THE WORLD TRADE CENTER

TITLE

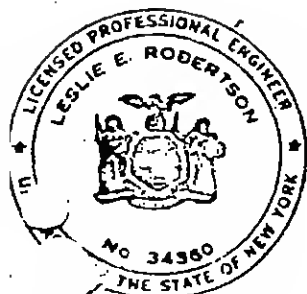
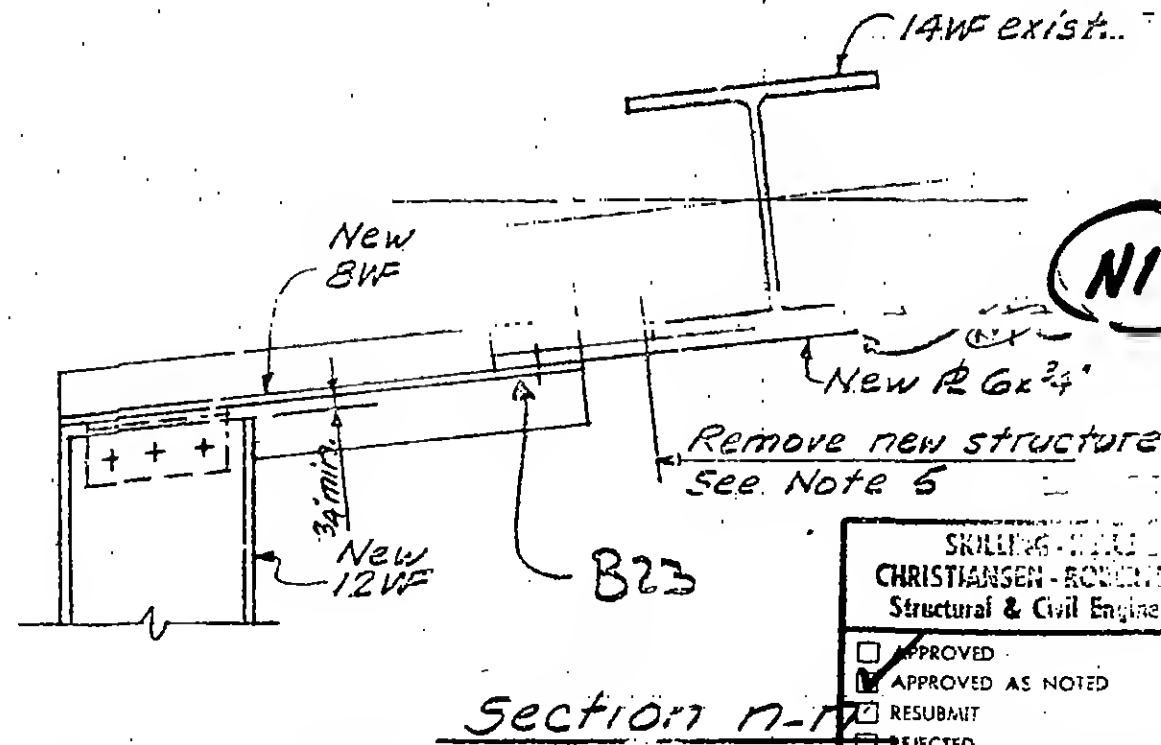
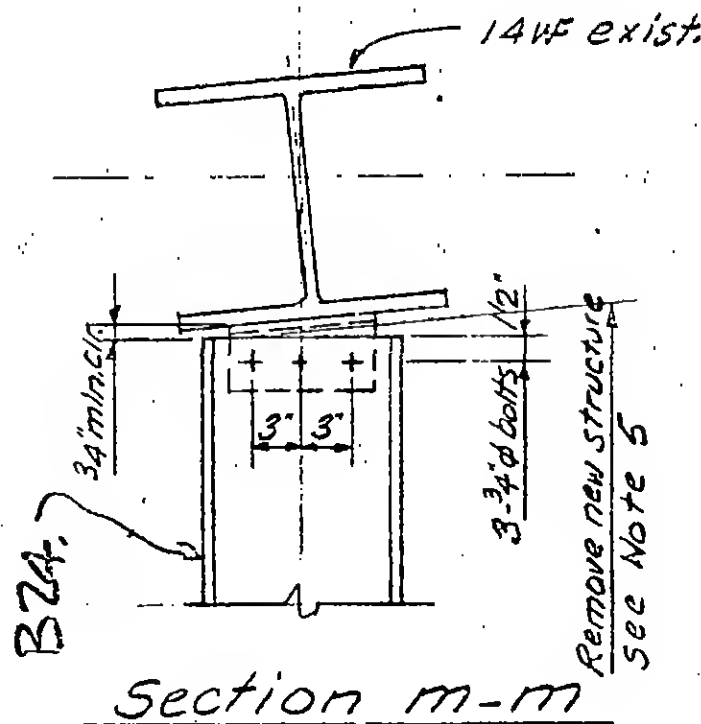
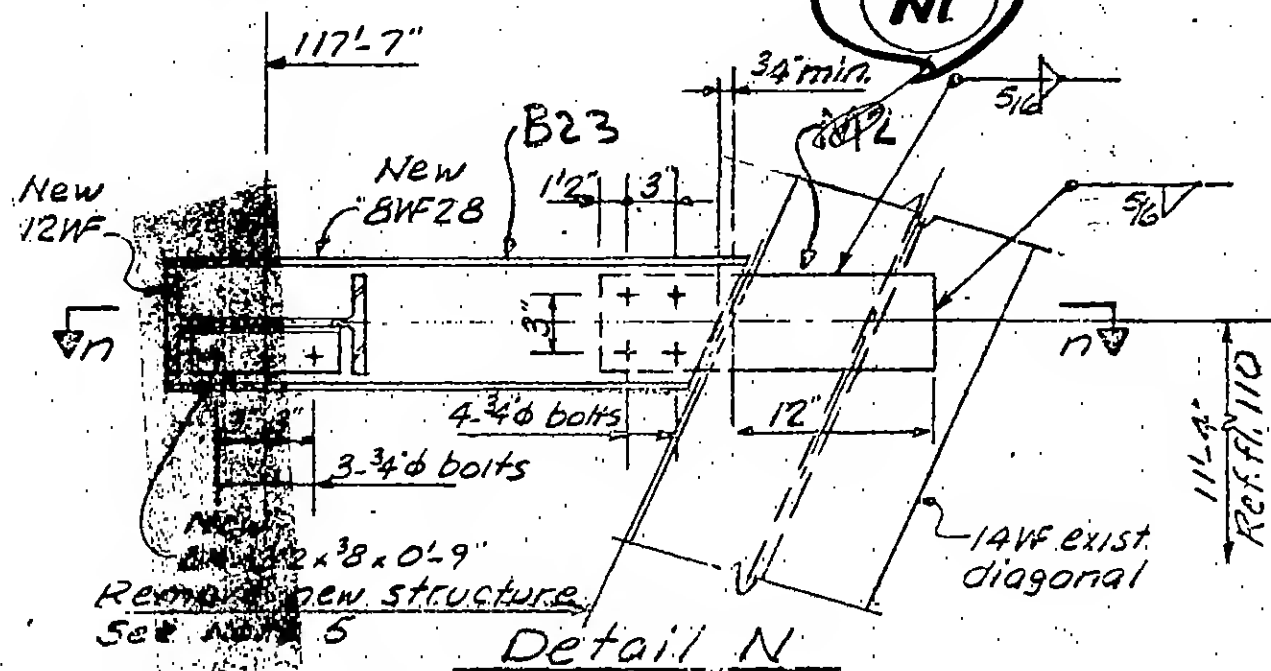
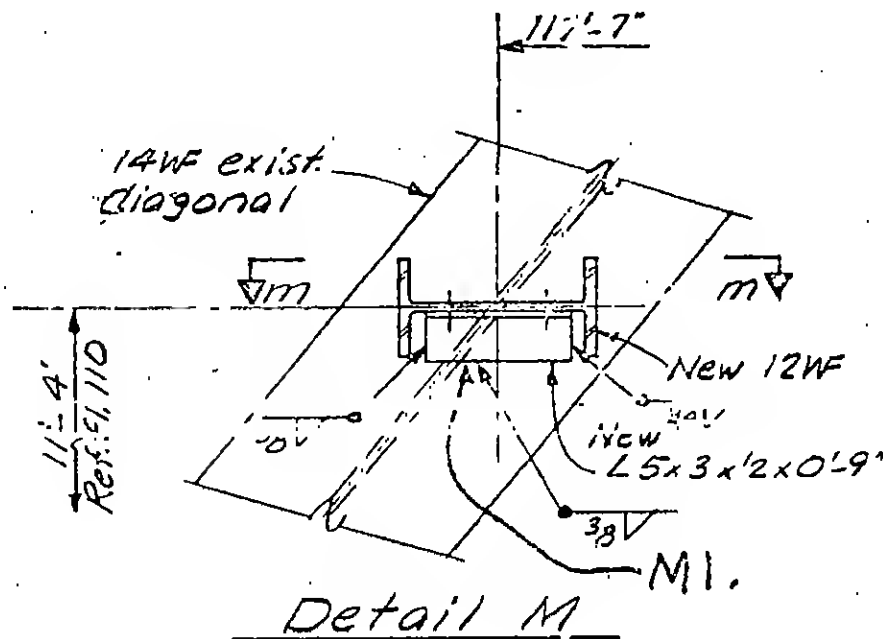
TOW

EXTENSION

DATE

1-10-72

REVISIONS



DESIGNED
M. RAMANI

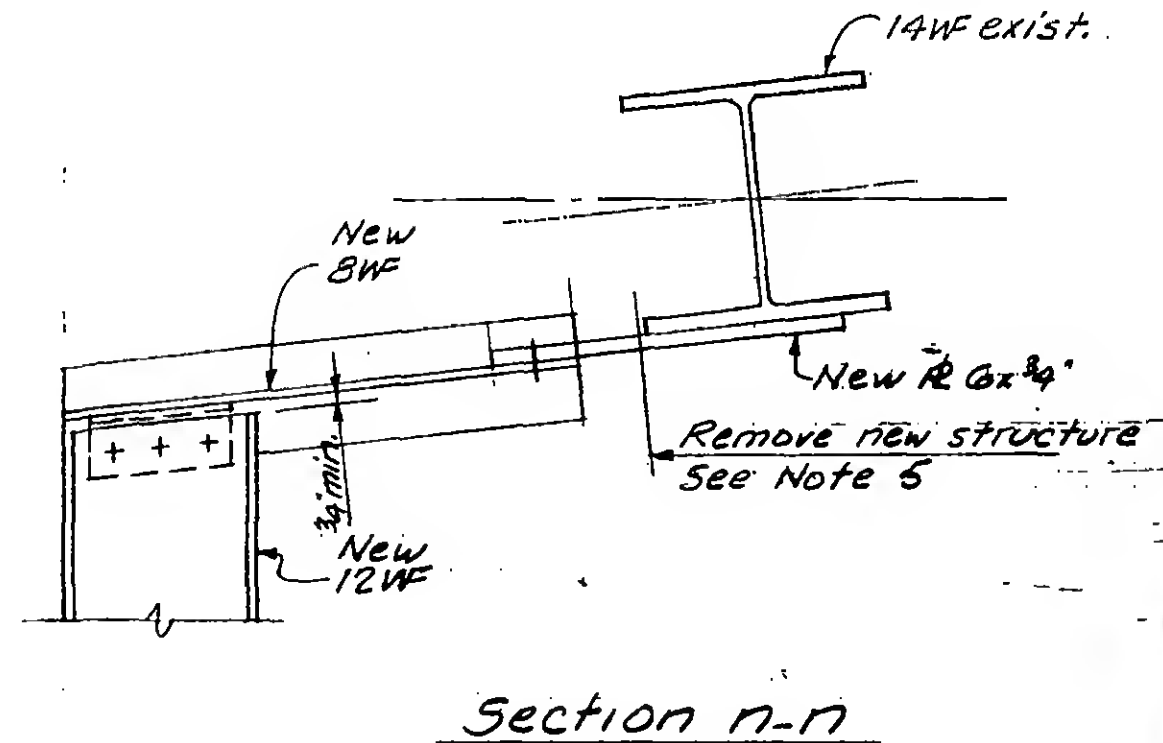
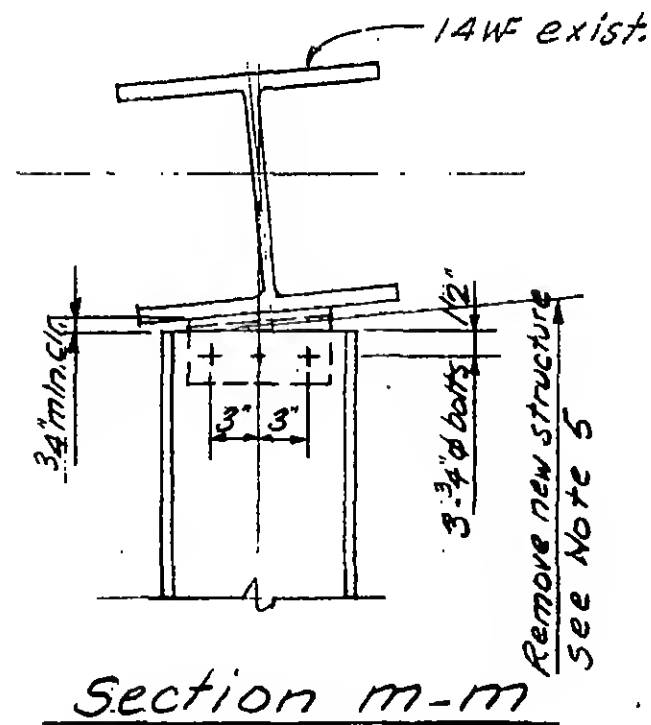
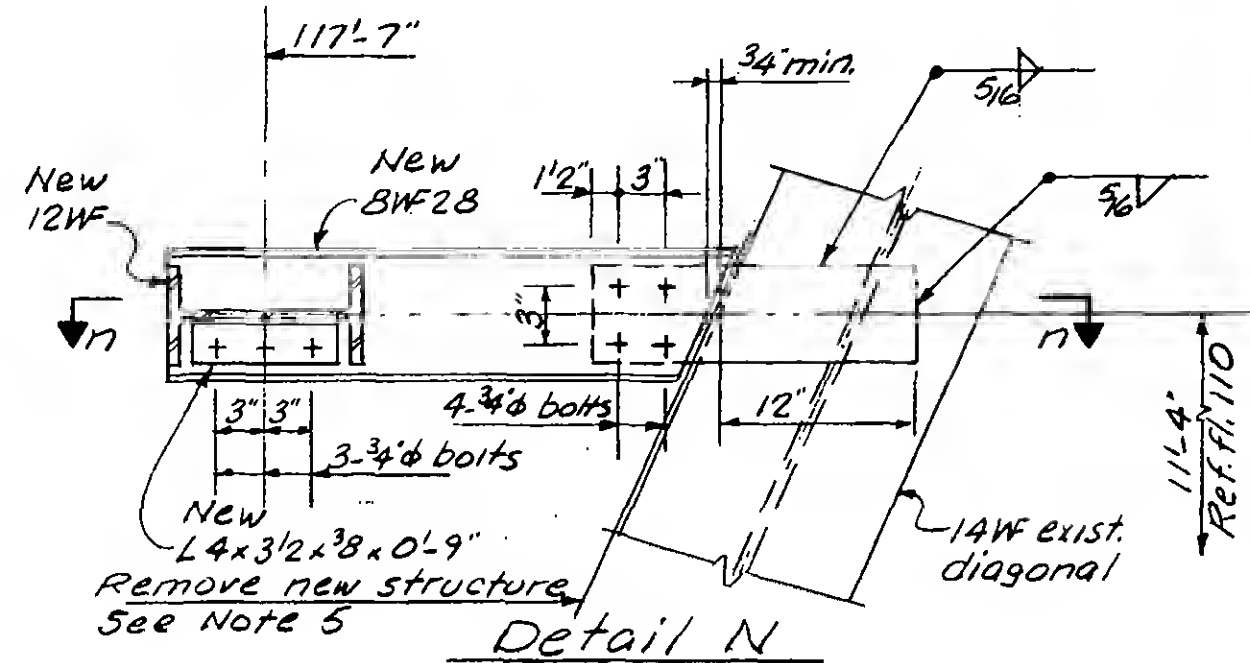
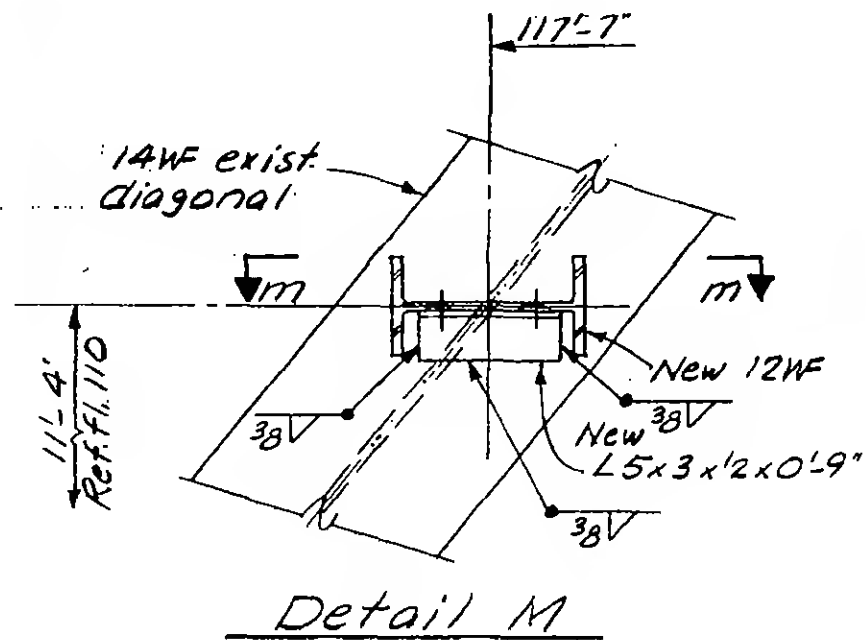
DESIGN
M. RAMANI

| | |
|--|---|
| SKILLING, HELLE, CHRISTIANSEN, ROBERTSON Structural & Civil Engineers | |
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| <input type="checkbox"/> RESUBMIT | <input type="checkbox"/> REJECTED |
| Date 3/2/72 By ALR | |

ERECTION PLAN
E2

19-B-1108.10

REVISIONS



DESIGNED
M. RAMANI

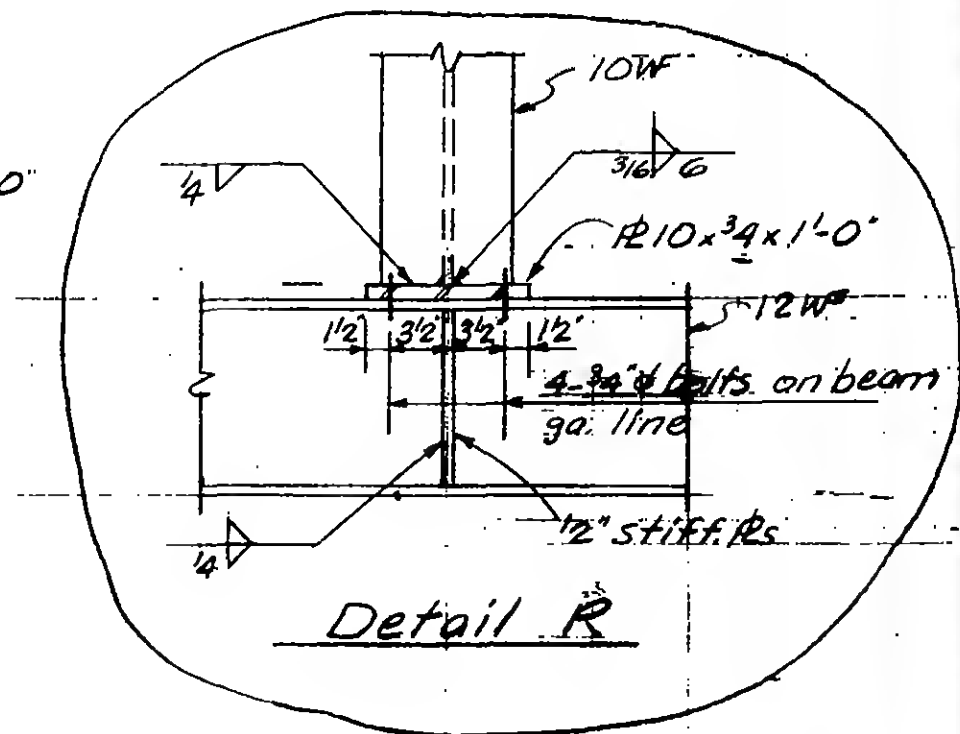
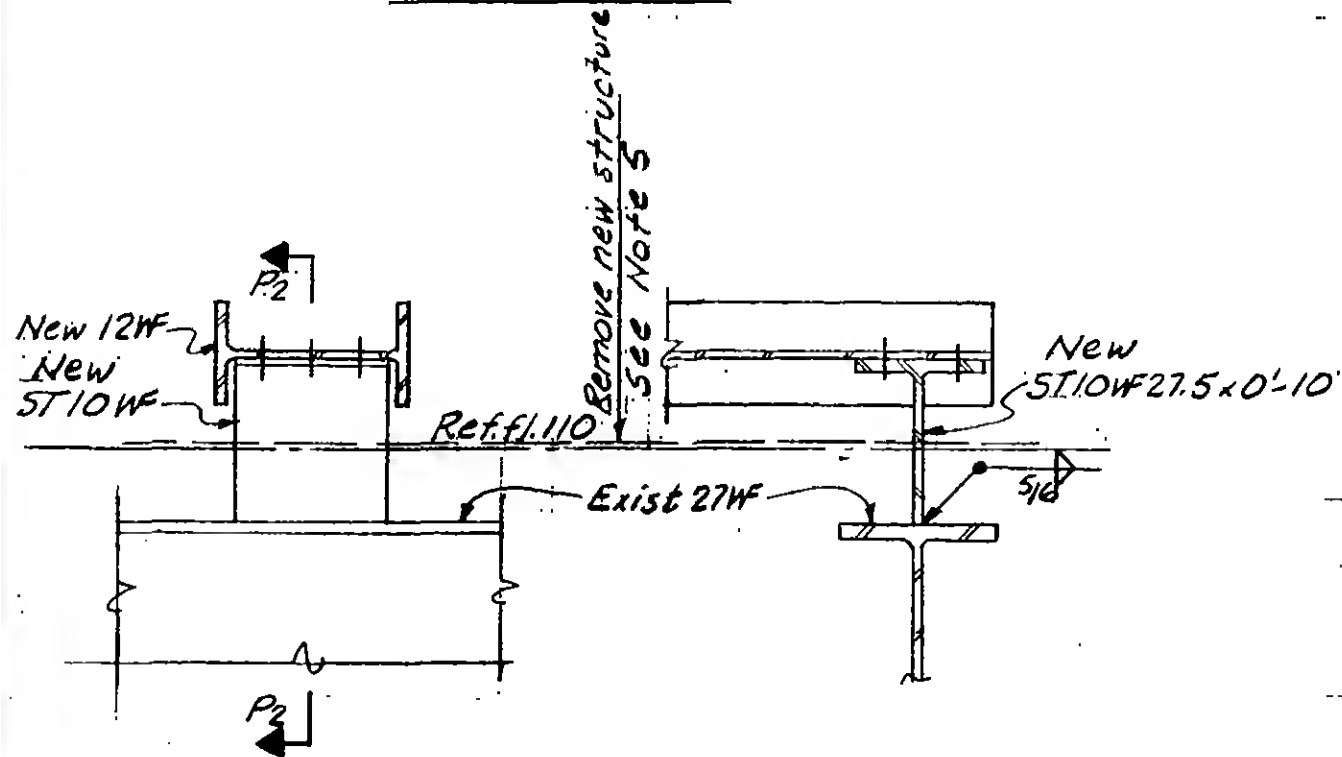
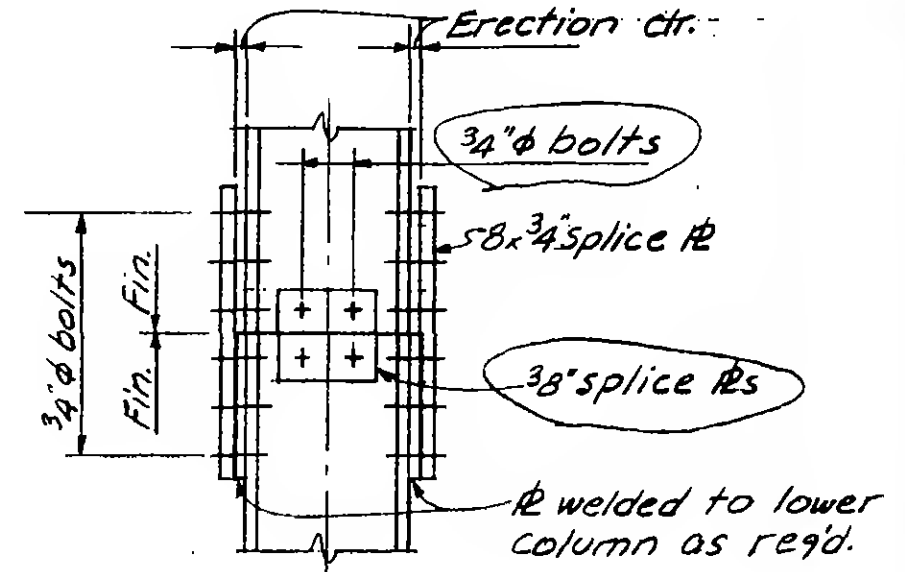
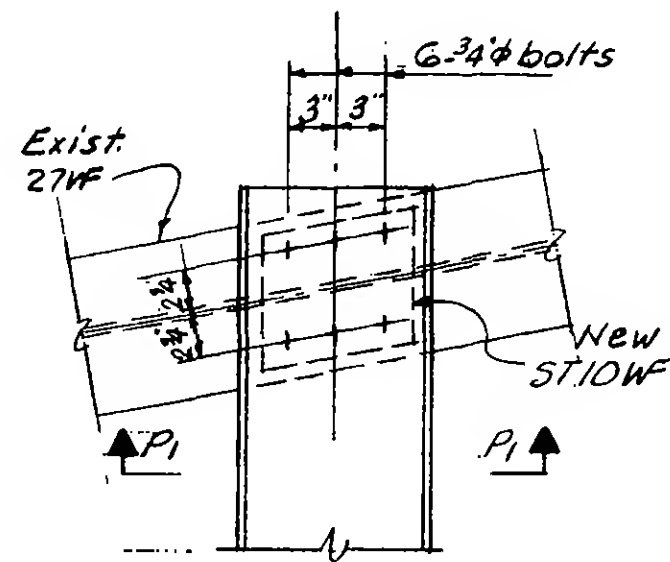
DRAWN
A. FRANQUI

REVIEWED

19-B-1108.10

REVISIONS

R

DESIGNED
M. RAMANIDRAWN
A. FRANQUI

REVIEWED

PROJECT

THE WORLD TRADE CENTER

TITLE

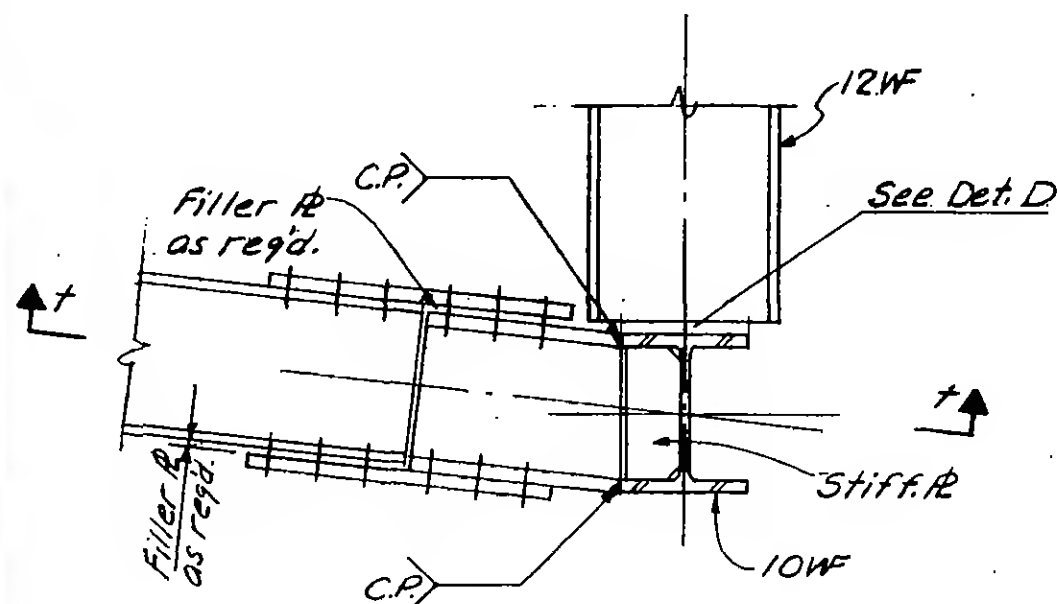
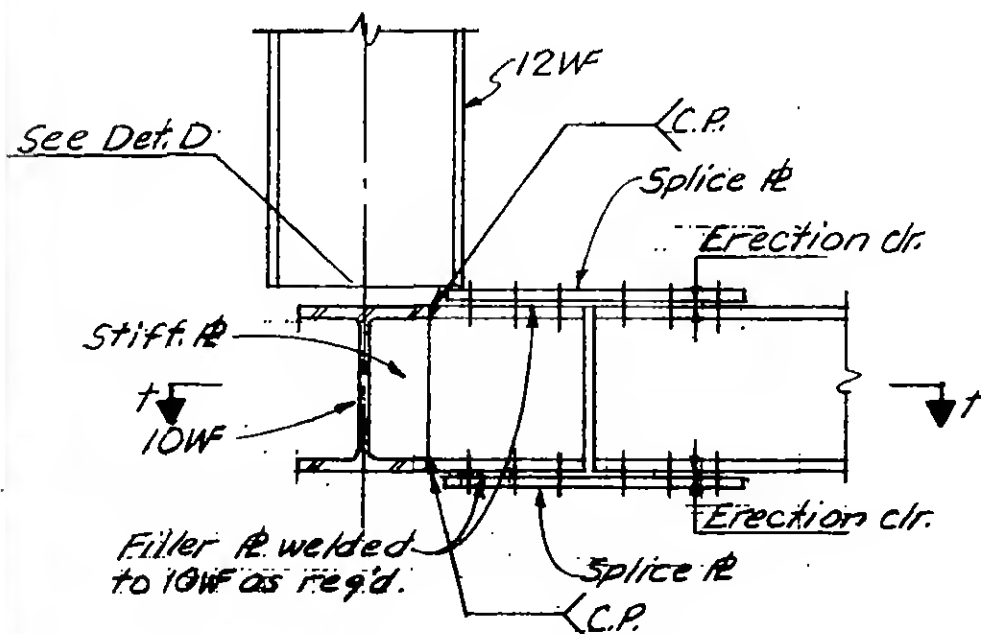
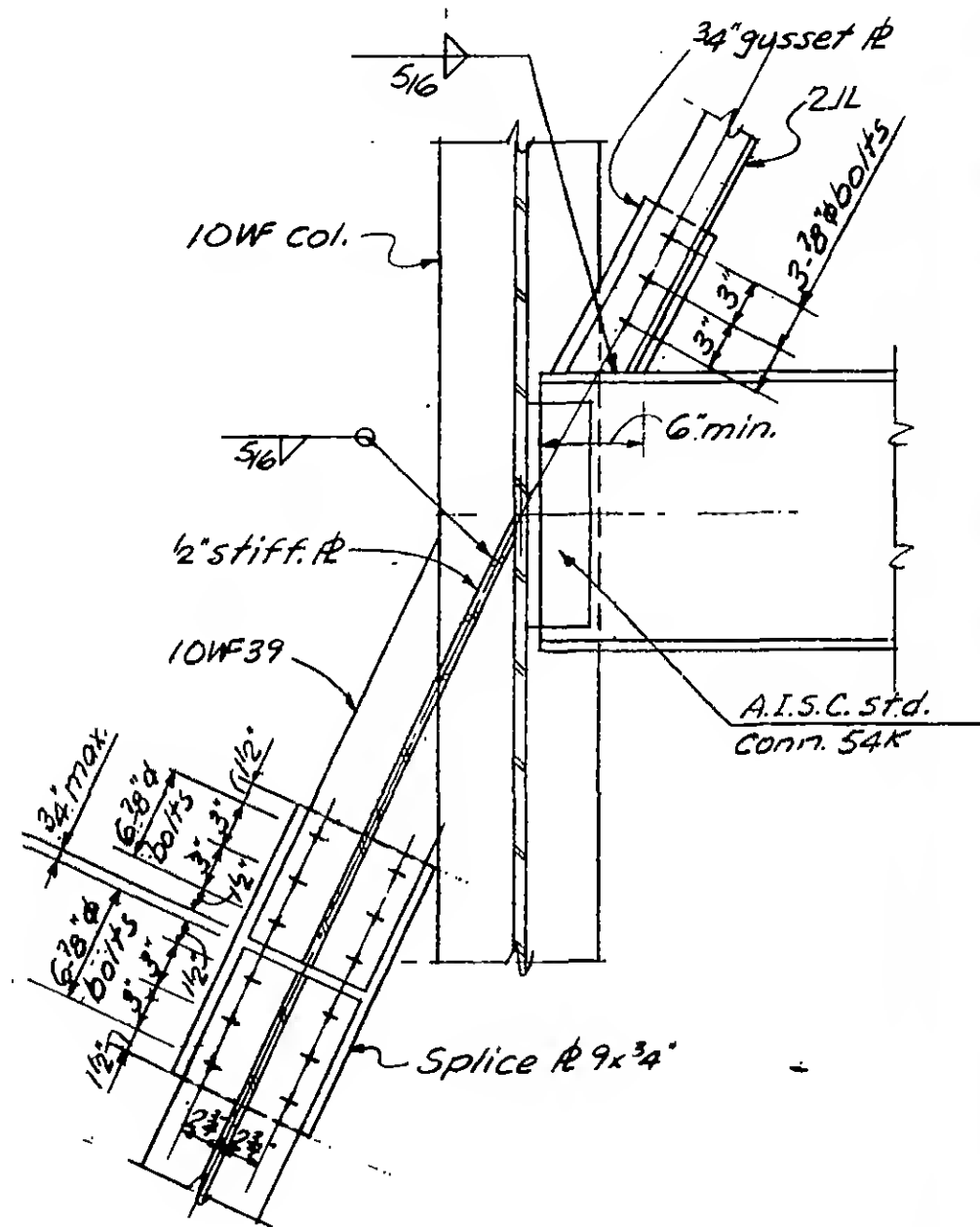
TOWER B-P.H. - SHAFT 50 EXTENSION

DATE

1-10-72

REVISIONS

R

Detail SDetail TSection t-tDESIGNED
M. RAMANIDRAWN
A. FRANQUI

REVIEWED

19-B-1108.12

SKILLING, HELLE, CHRISTIANSEN, ROBERTSON

PROJECT THE WORLD TRADE CENTER

TITLE TOWER

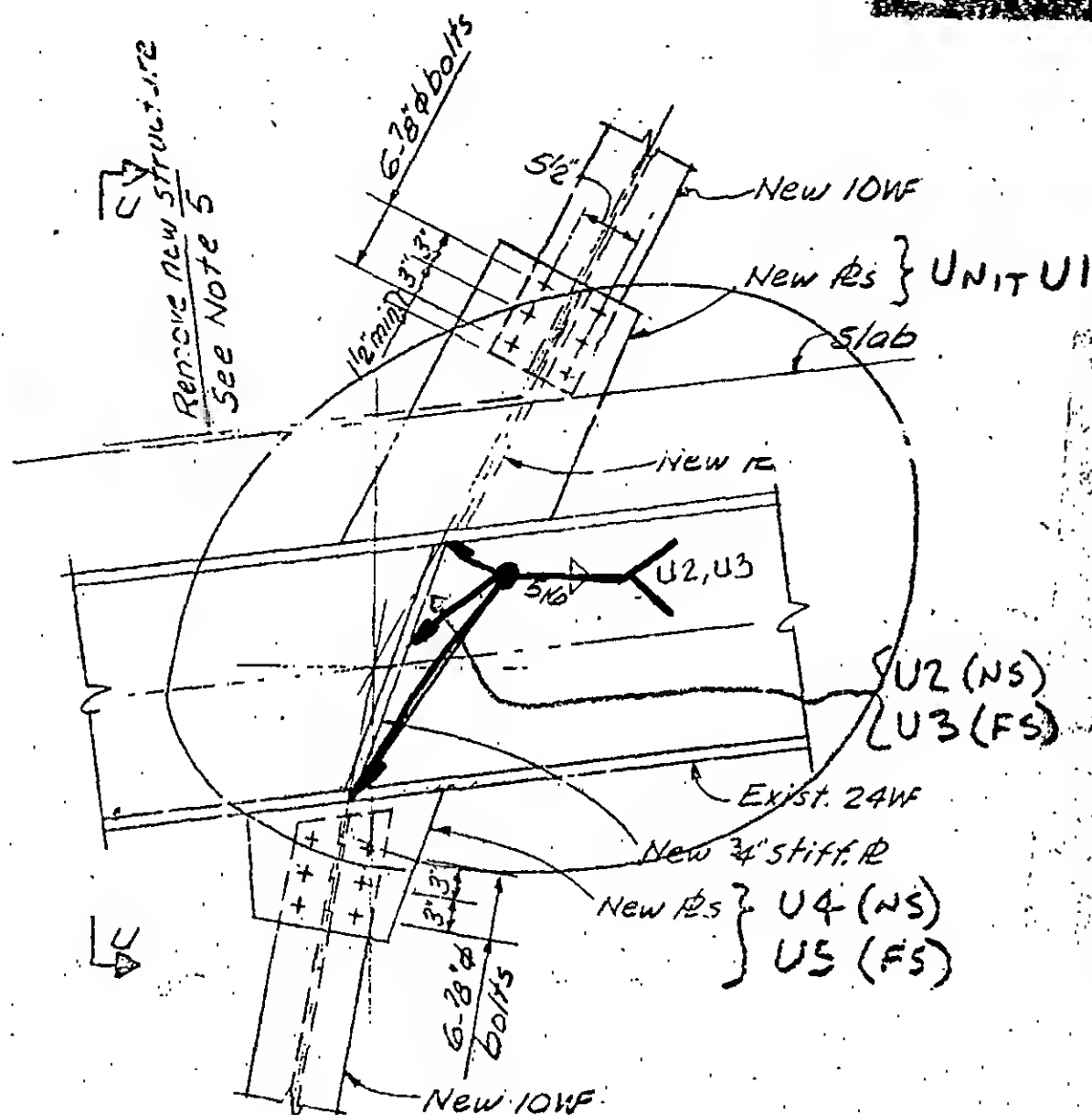
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TENSION

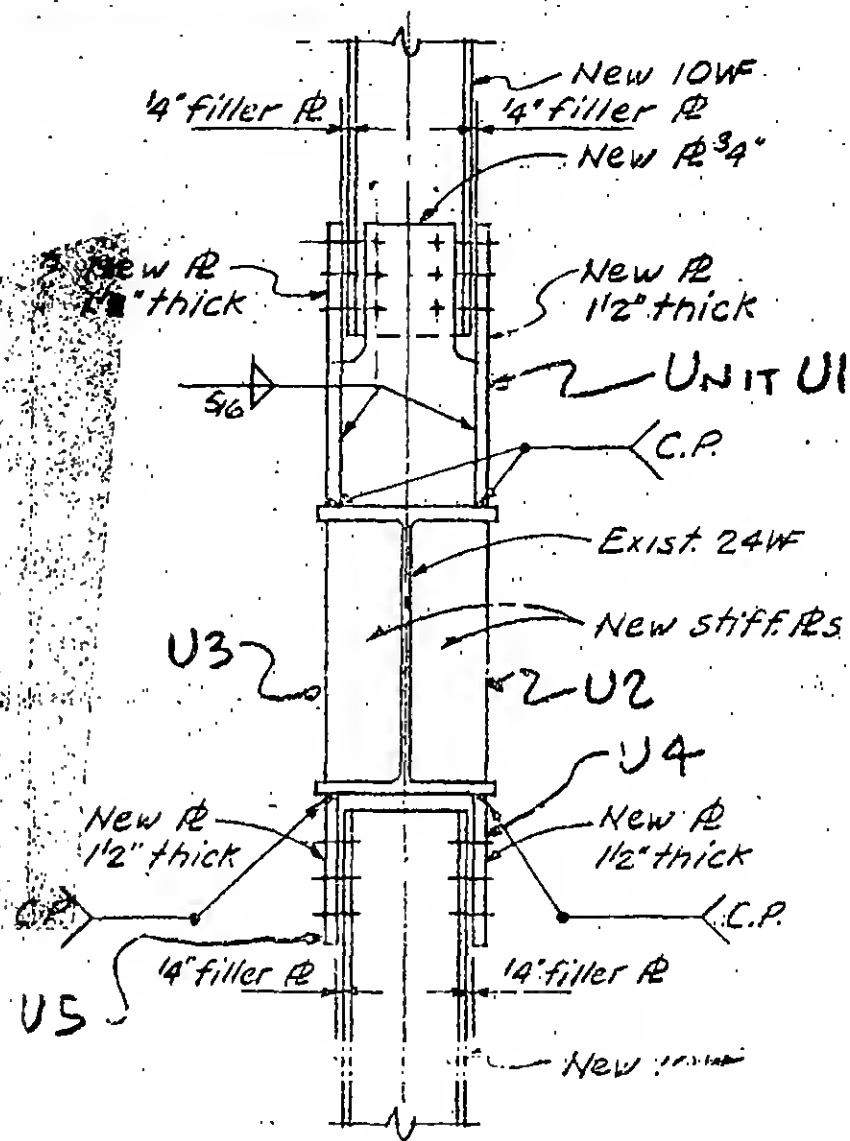
DATE 1-10-72

REVISIONS

R



Detail U

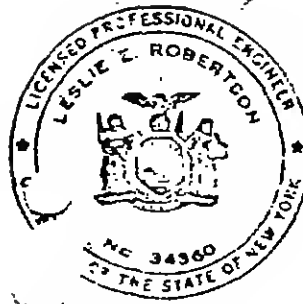


Section U-1

| | |
|--|---|
| SKILLING - HELLE CHRISTIANSEN - ROBERTSON Structural & Civil Engineers | |
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| <input checked="" type="checkbox"/> RESUBMIT | <input type="checkbox"/> REJECTED |
| Date 3/6/72 By ALR | |

19-B-1108.13

ERECTION PLAN
ES

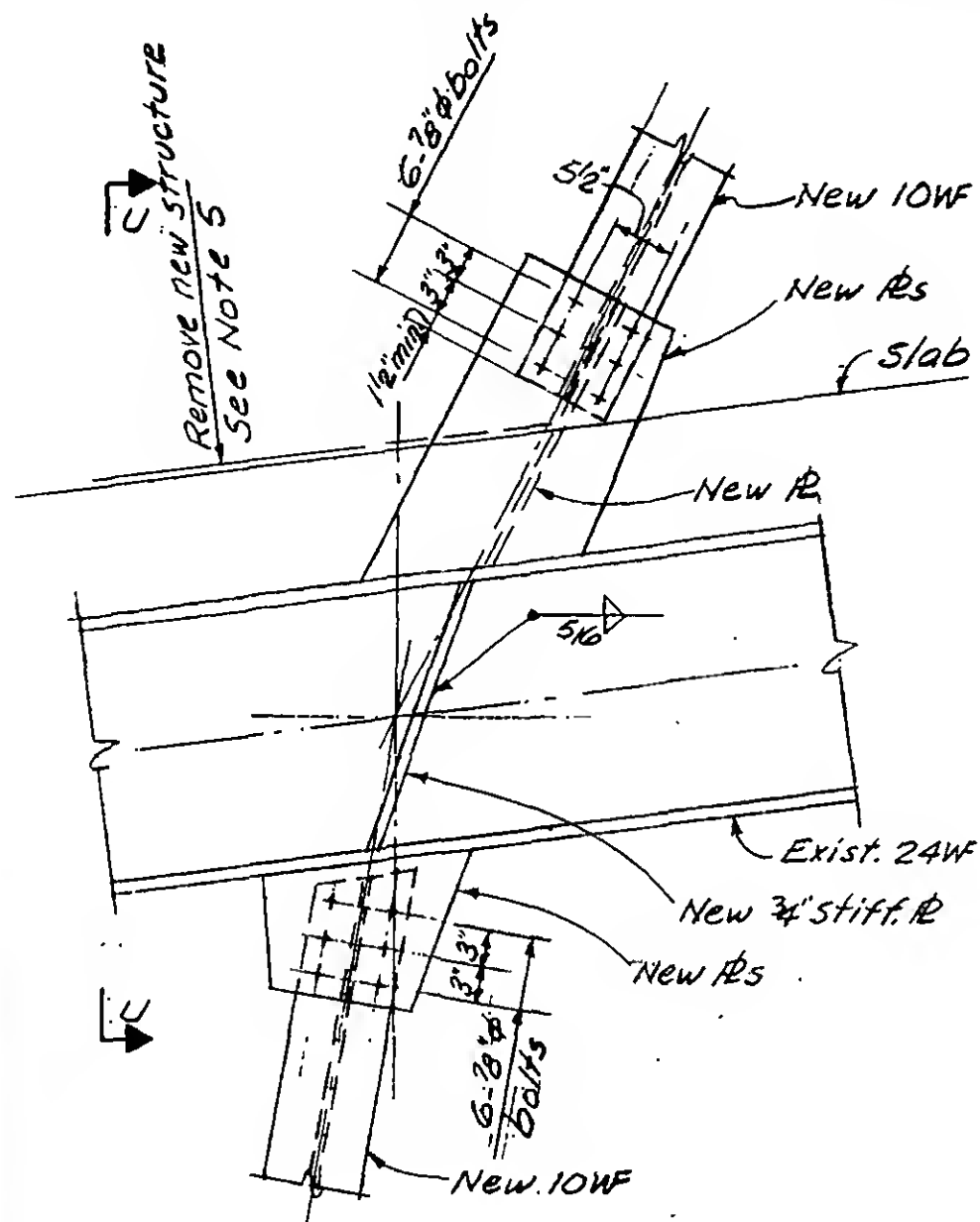
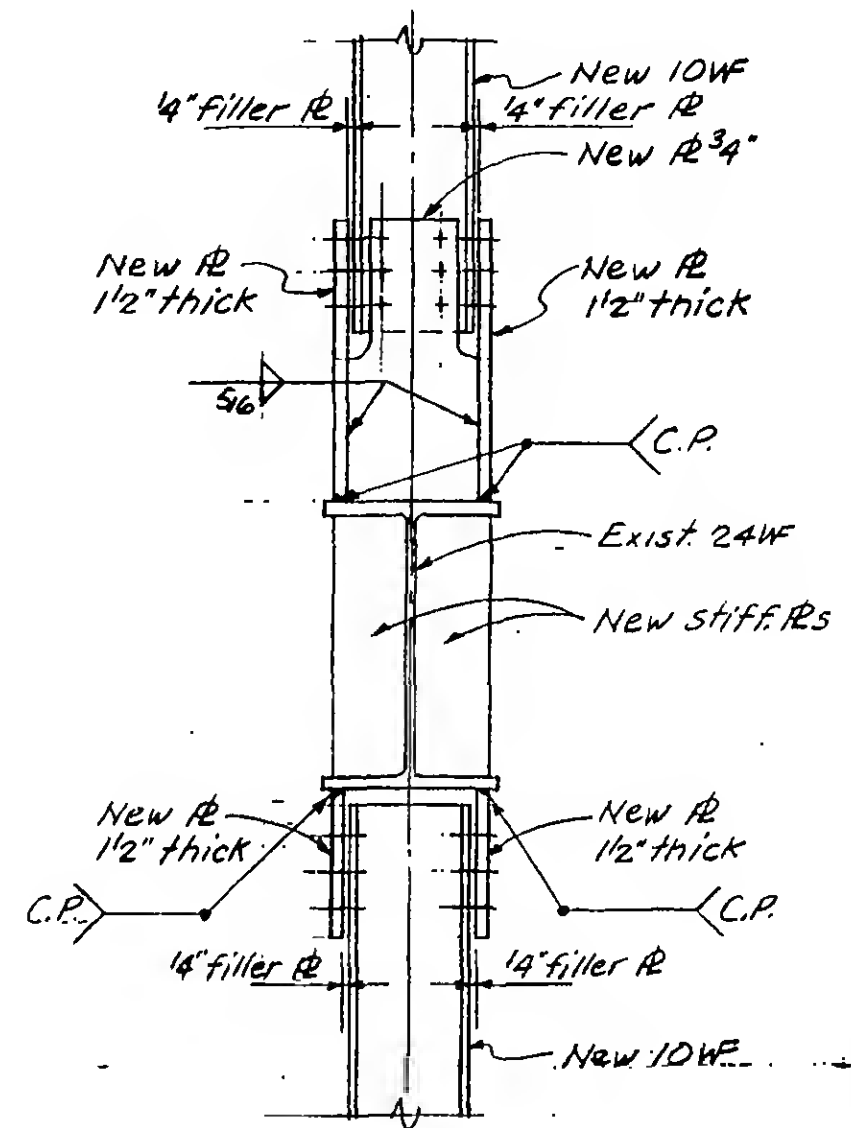


DESIGNED
ALP/AMM

CHECKED

REVISIONS

R

Detail USection U-UDESIGNED
M. RAMANIDRAWN
A. FRANQUI

REVIEWED

SKILLING, HELLE, CHRISTIANSEN, ROBERTSON

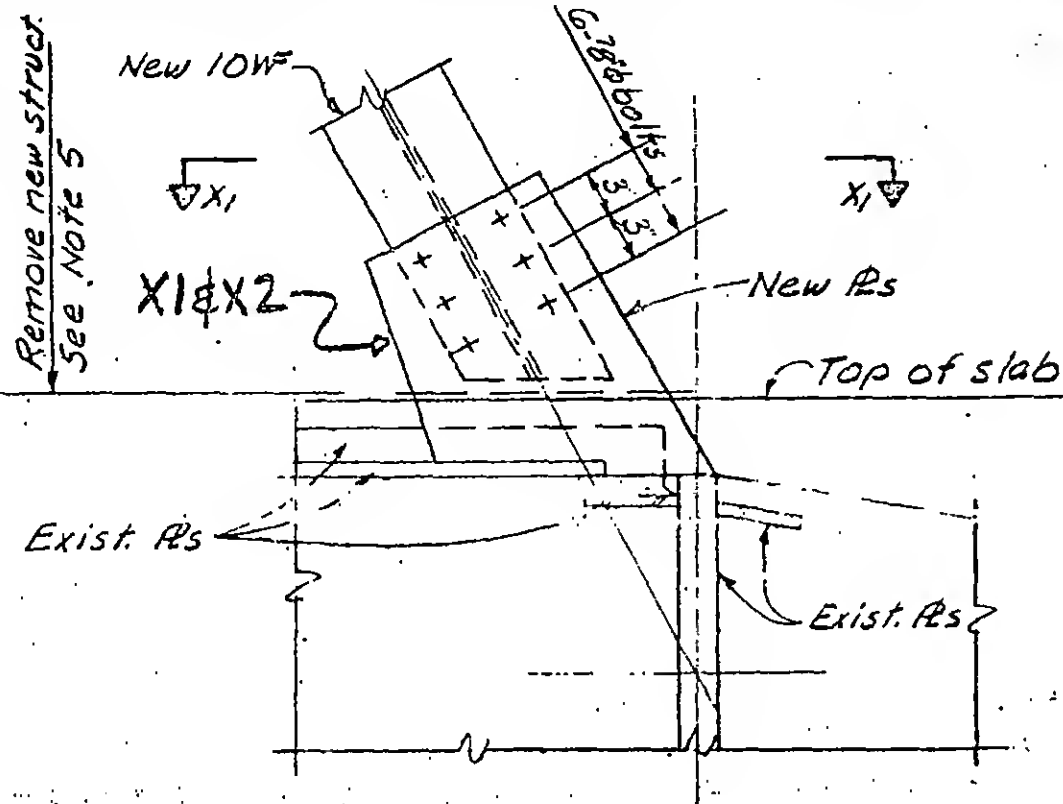
PROJECT THE WORLD TRADE CENTER

TITLE TOWER SHaft SO EXTENSION

DATE 1-10-72

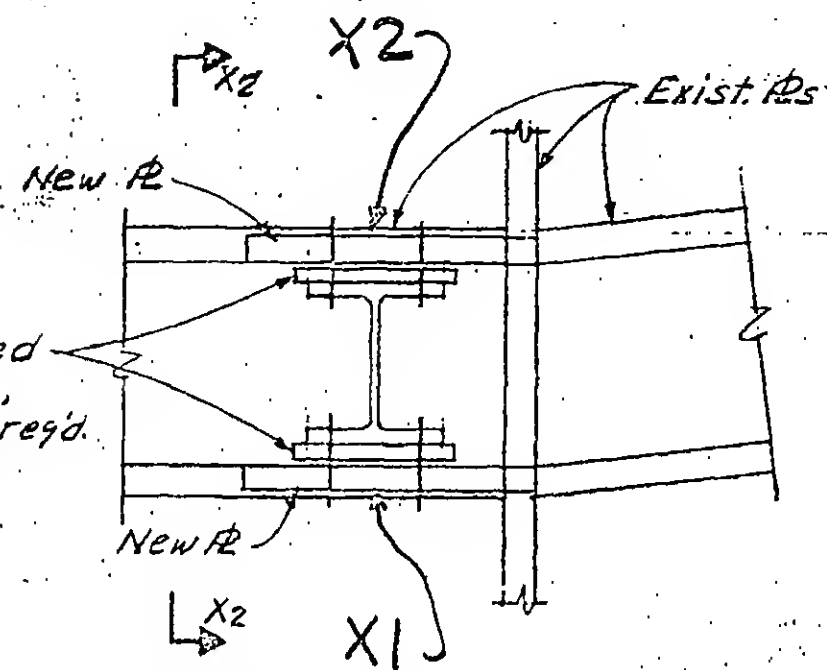
REVISIONS

Remove new struct.
See Note 5

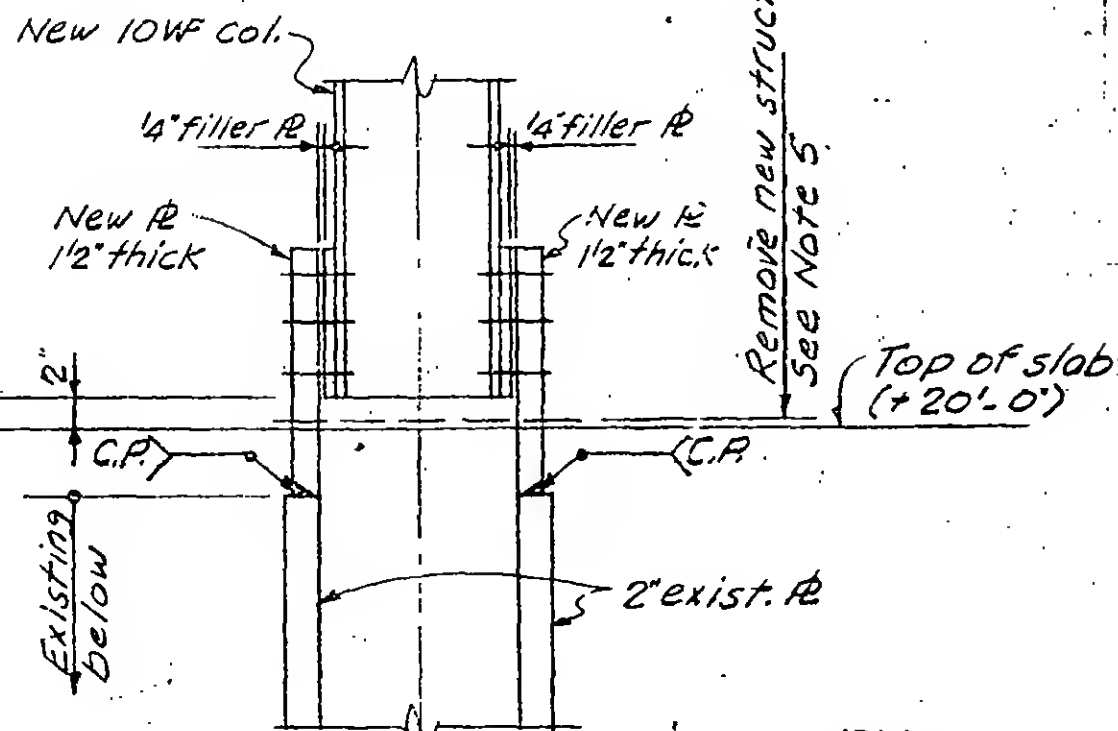


Detail X

New P welded
to column,
thickness as req'd.



Section X1-X1



Section X2-X2

| | |
|--|-------------------|
| SKILLING - HELLE CHRISTIANSEN - ROBERTSON Structural & Civil Engineers | |
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| Date 3/6/72 By ALR | |



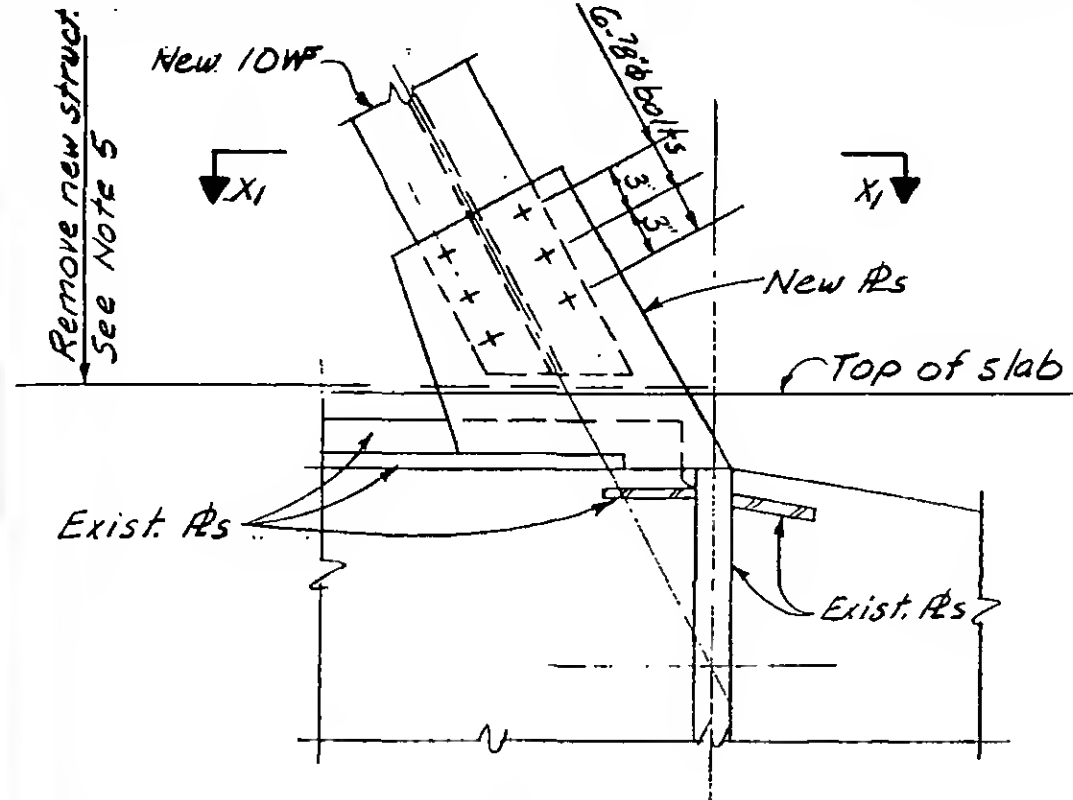
DESIGNED
M. RAMANI

19-B-1108.14

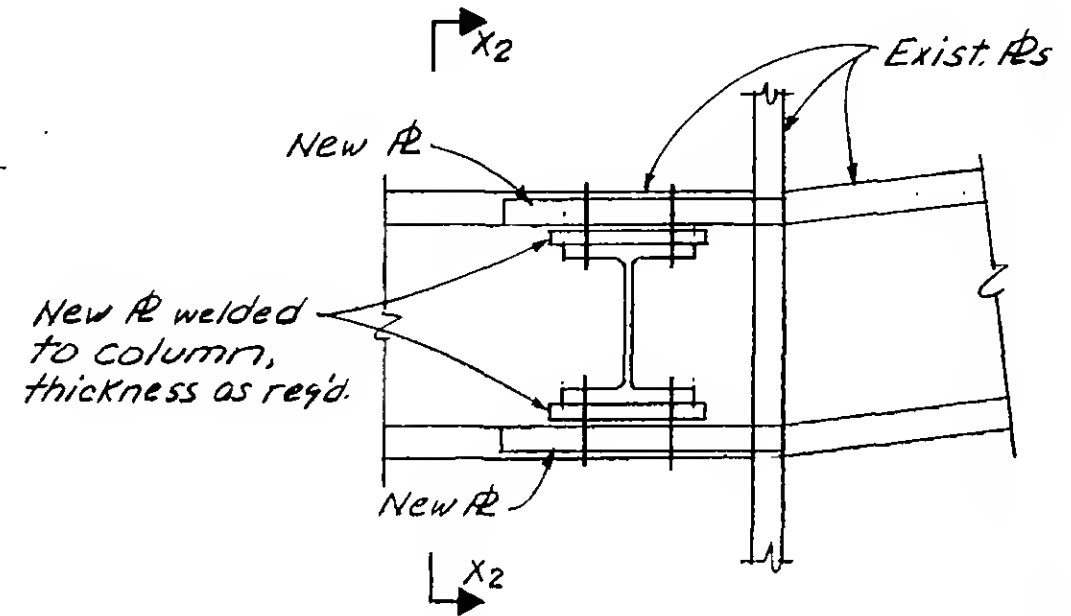
ERECTION PLAN
E9

REVISIONS

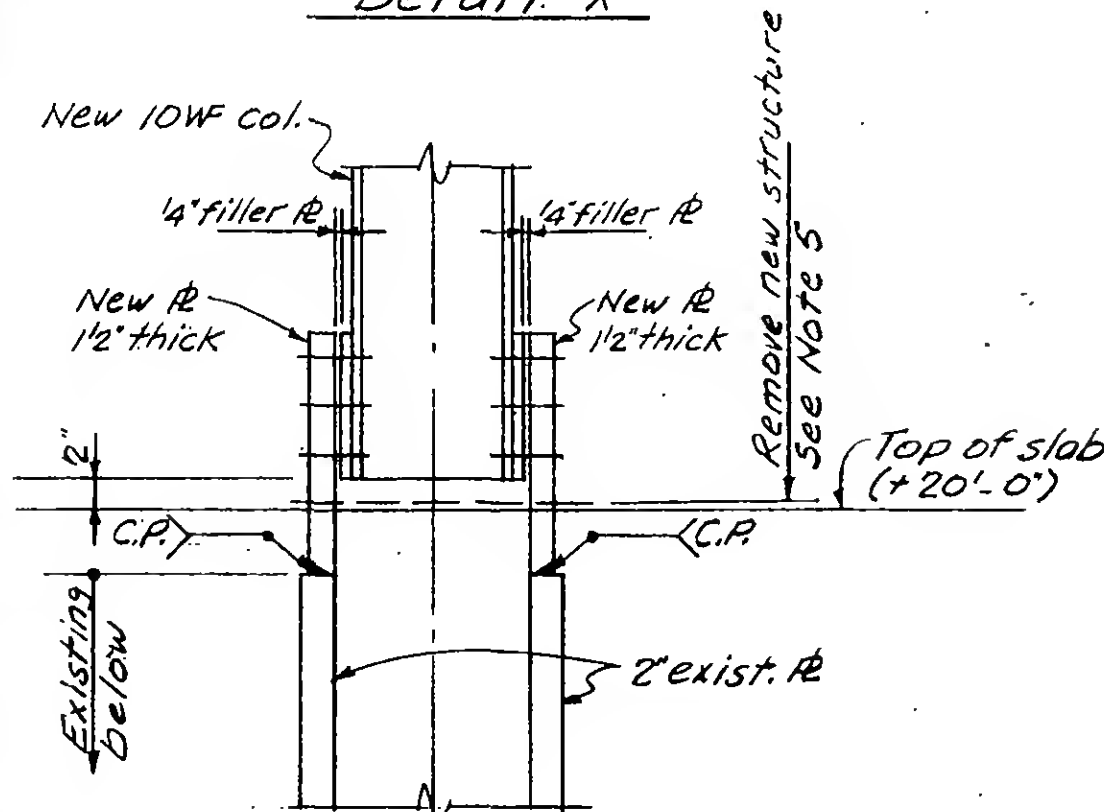
R



Detail X



Section X1-X1



Section X2-X2



DESIGNED
M. RAMANI

DRAWN
A. FRANQUI

REVIEWED

SKILLING, HELLE. CHRISTIANSEN, ROBERTSON

Engineers

PROJECT THE WORLD TRADE CENTER

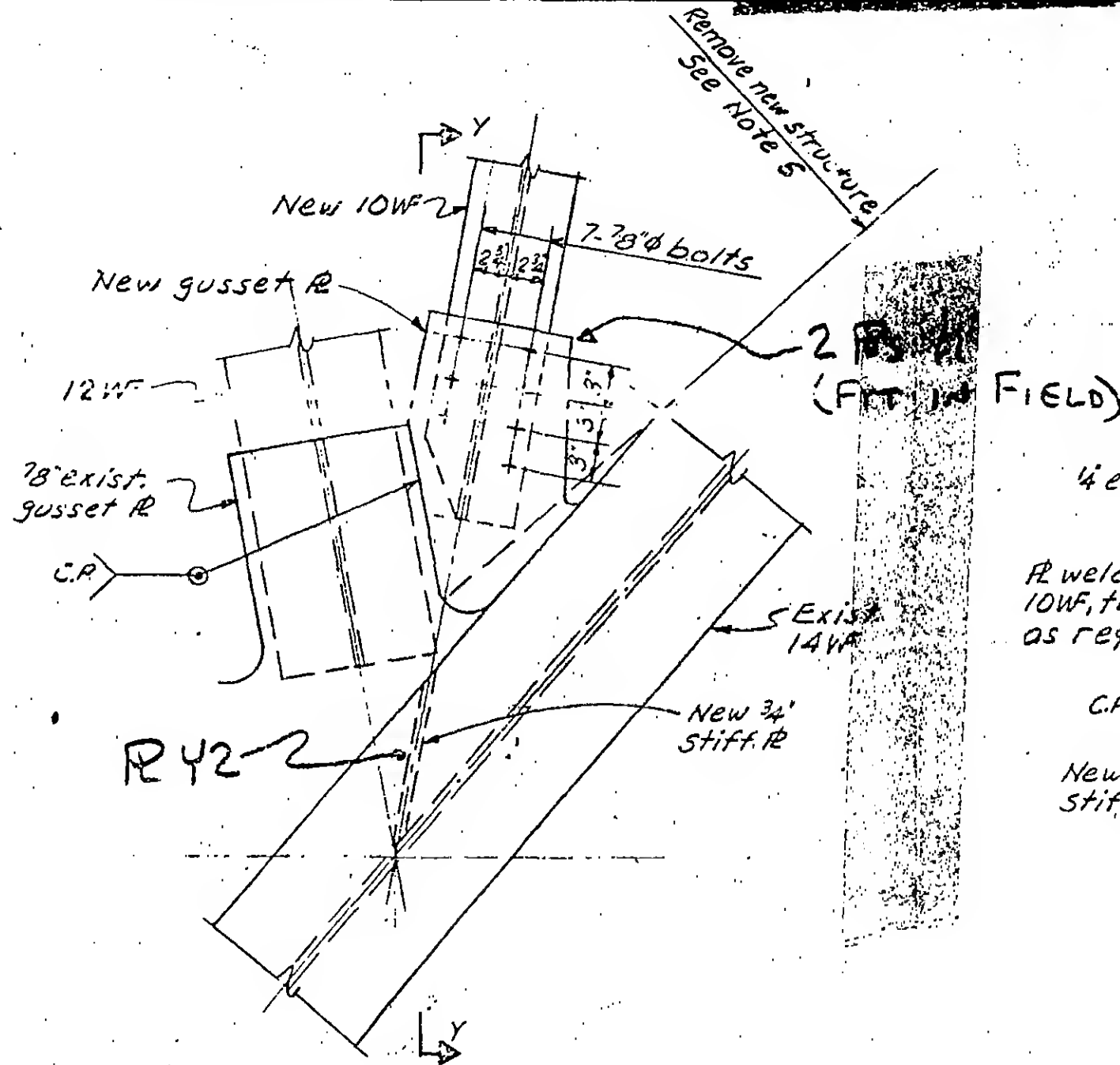
TITLE TOWER

AND EXTENSION

DATE 1-10-72

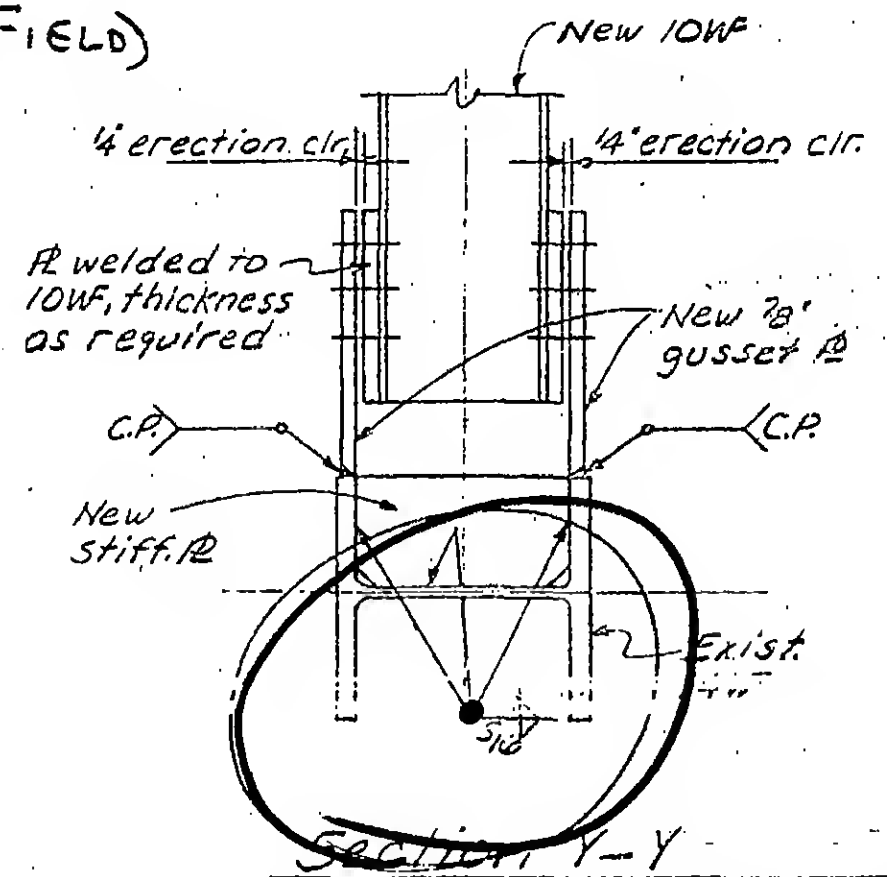
REVISIONS

R



Detail Y

(FIT IN FIELD)



SECTION Y-Y



DESIGNED M. RAMANI

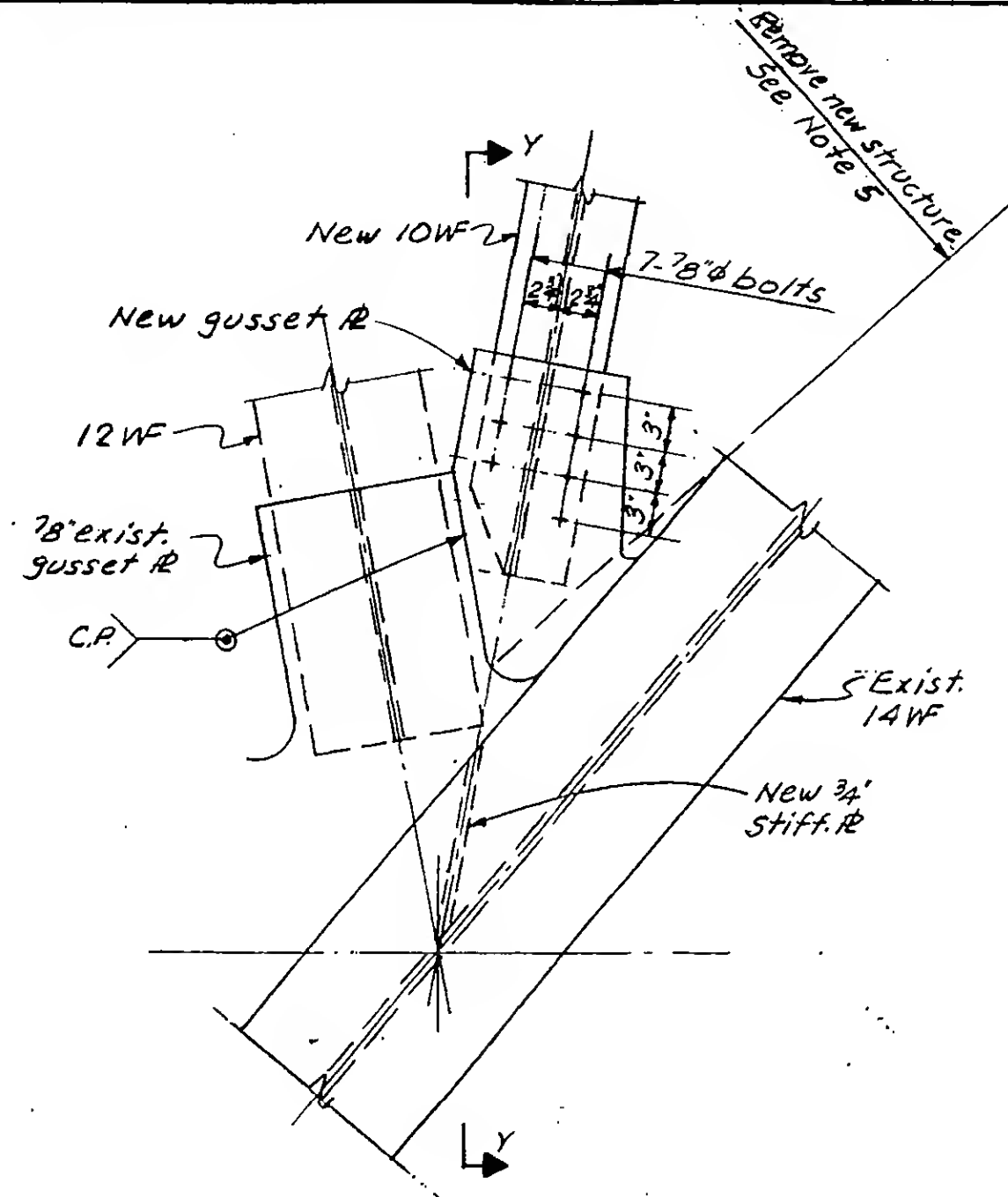
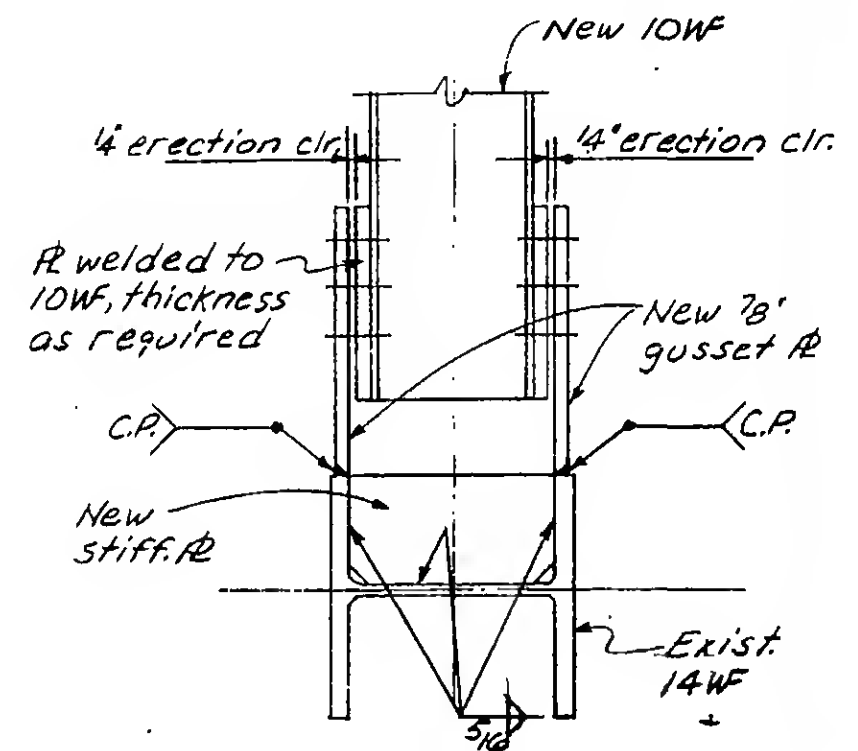
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|--|--------|
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| <input type="checkbox"/> REJECTED | |
| Date 3/6/72 | By ALR |

19-B-1108-15

ERECTION PLAN

REVISIONS

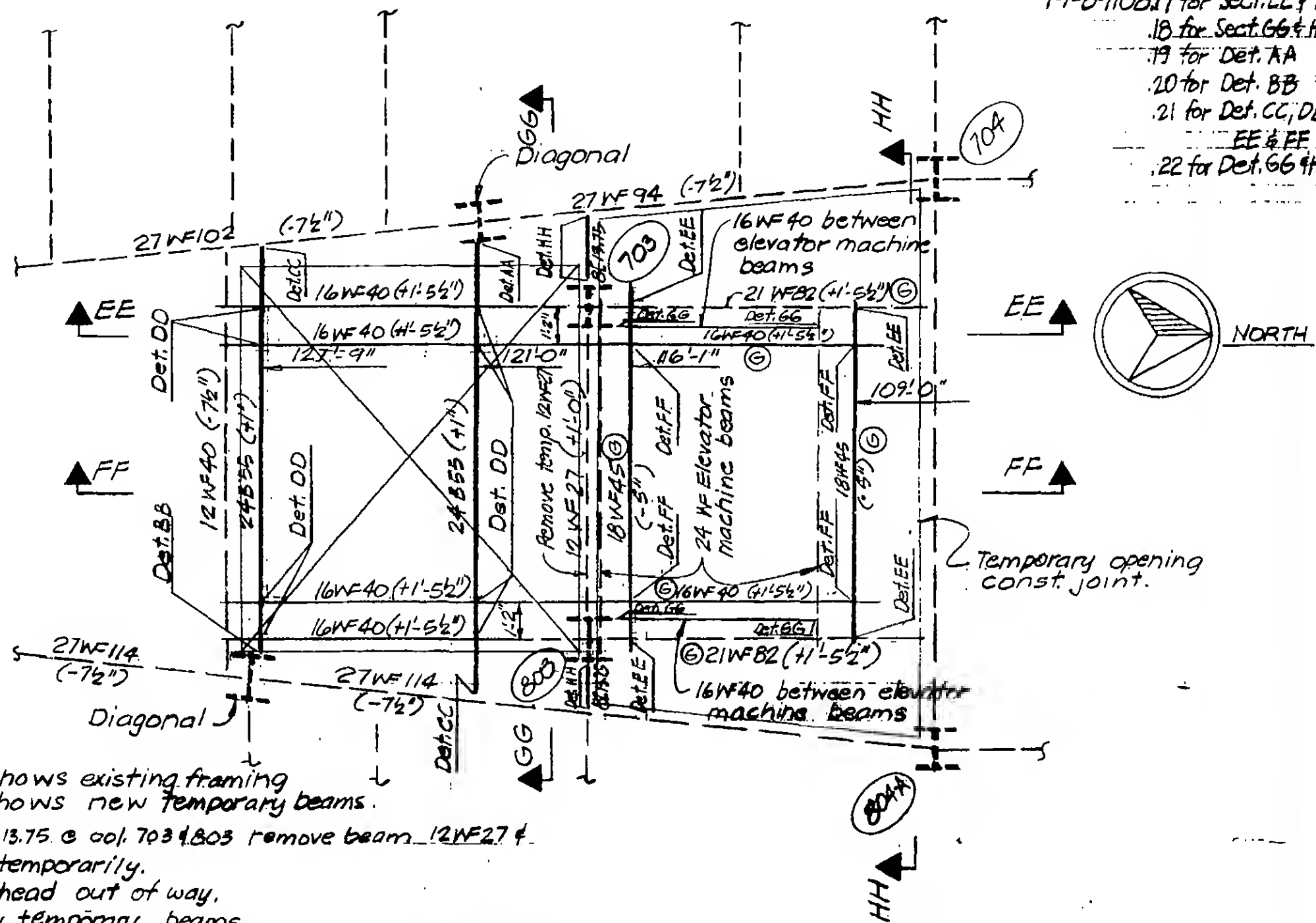
R

Detail YSection Y-YDESIGNED
M. RAMANIDRAWN
A. FRANGUI

REVIEWED

19-B-1108.15

REVISIONS



Notes :

----- Shows existing framing
----- Shows new temporary beams.

- (A) Install 8 L13.75 @ 001.703 & 803 remove beam 12WF27 & store it temporarily.
- (B) Lower cathead out of way.
- (C) Install new temporary beams.
- (D) Remove Exist Temporary support shown on 19-AB-951.4.
- (E) Lower Machine on to rollers.
- (F) Roll Machine to temporary location shaft 99.
- (G) Remove Temporary Members and permanent 21WF in shaft 50. Store temporarily.

When Machine is to be placed in permanent location.

- ④ Replace Temporary & permanent members in shaft 50
⑤ Move Machine to permanent location, Remove all temporary members & replace 12W27 (A), 8L (A) may be left in place.



DESIGNED
M. Rdmani

DRAWN
P.M. Ozki

REVIEWED
W. B. Weaver

Part Plan 110th Floor

19-B-1108.16

PROJECT

THE WORLD TRADE CENTER

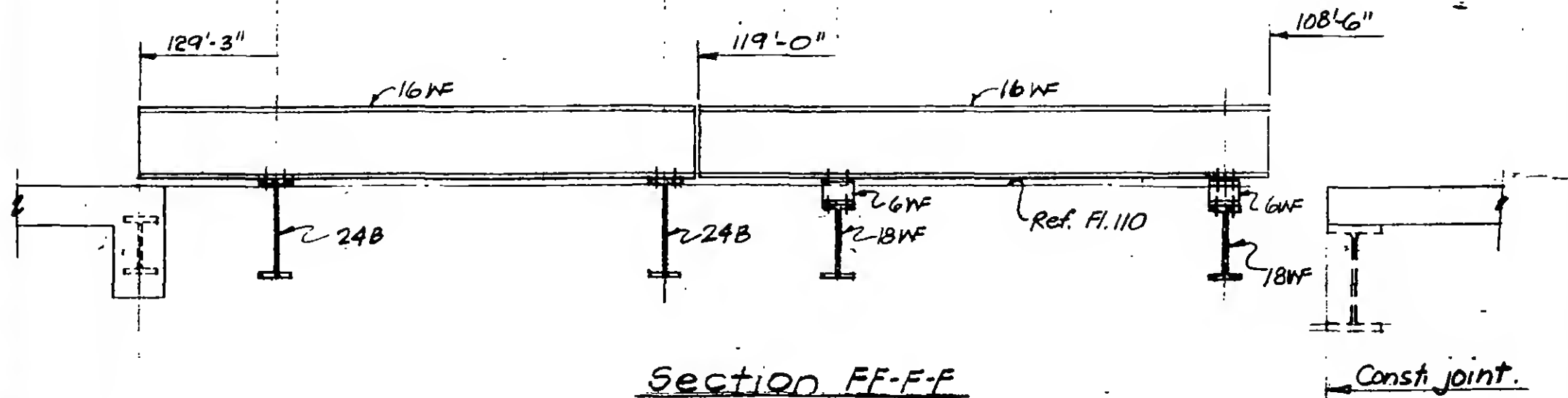
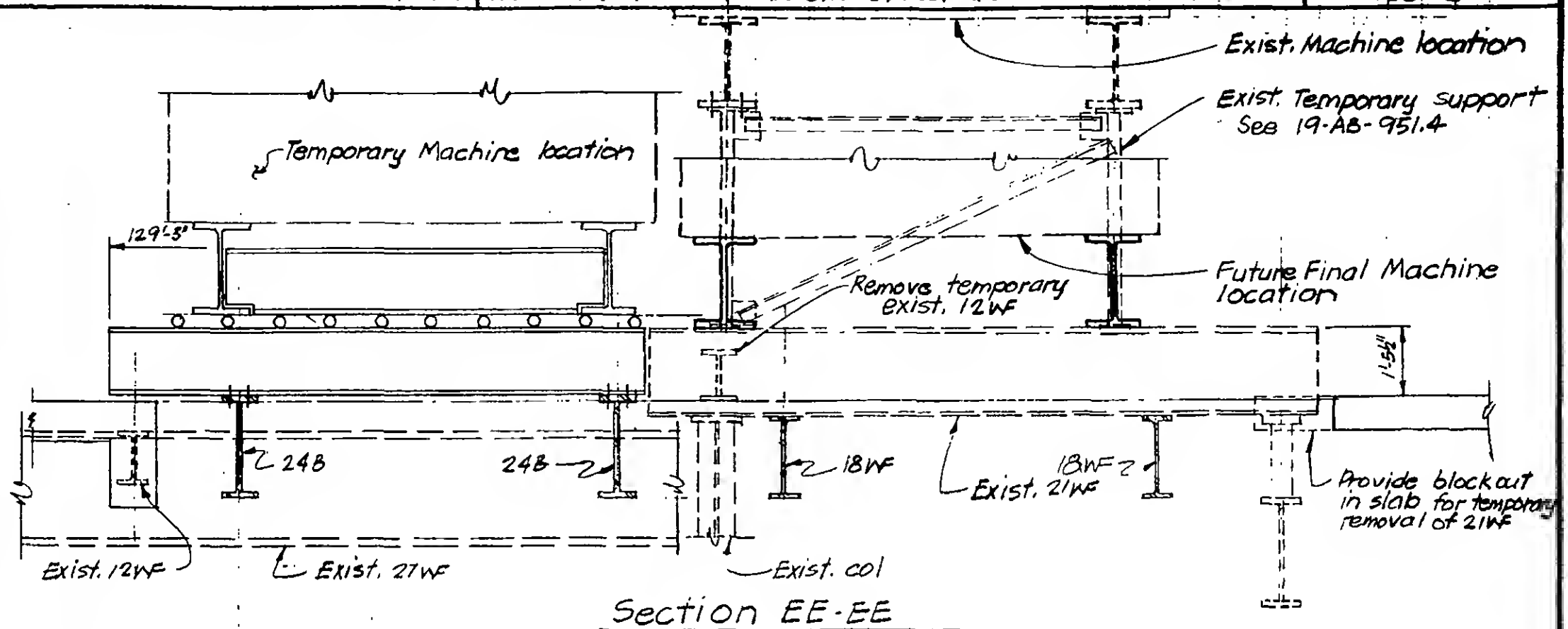
TITLE

TEMPORARY RELOCATION OF ELEV. 50 MACHINE

DATE

2-28-78

REVISIONS

DESIGNED
M. RamaniDRAWN
P.M. OzekiREVIEWED
1/1/78

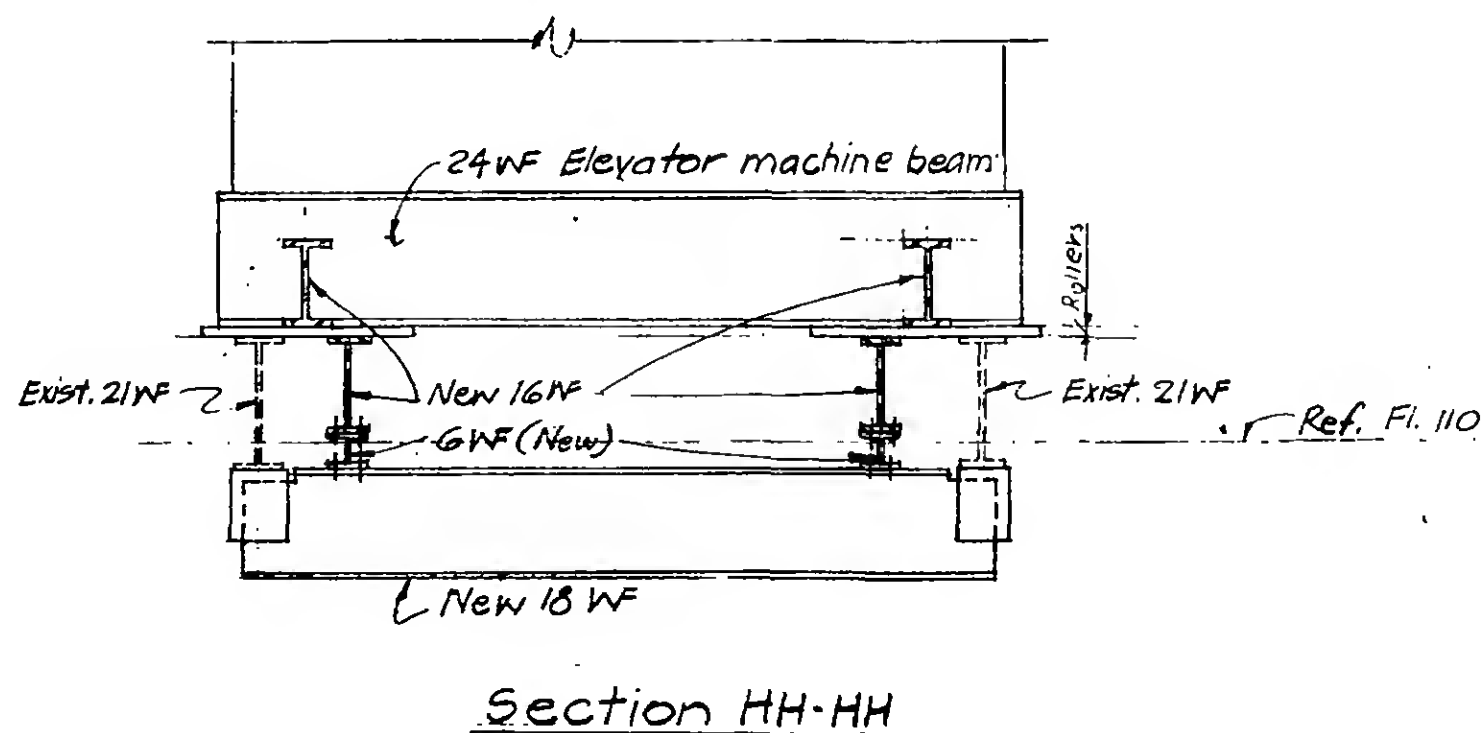
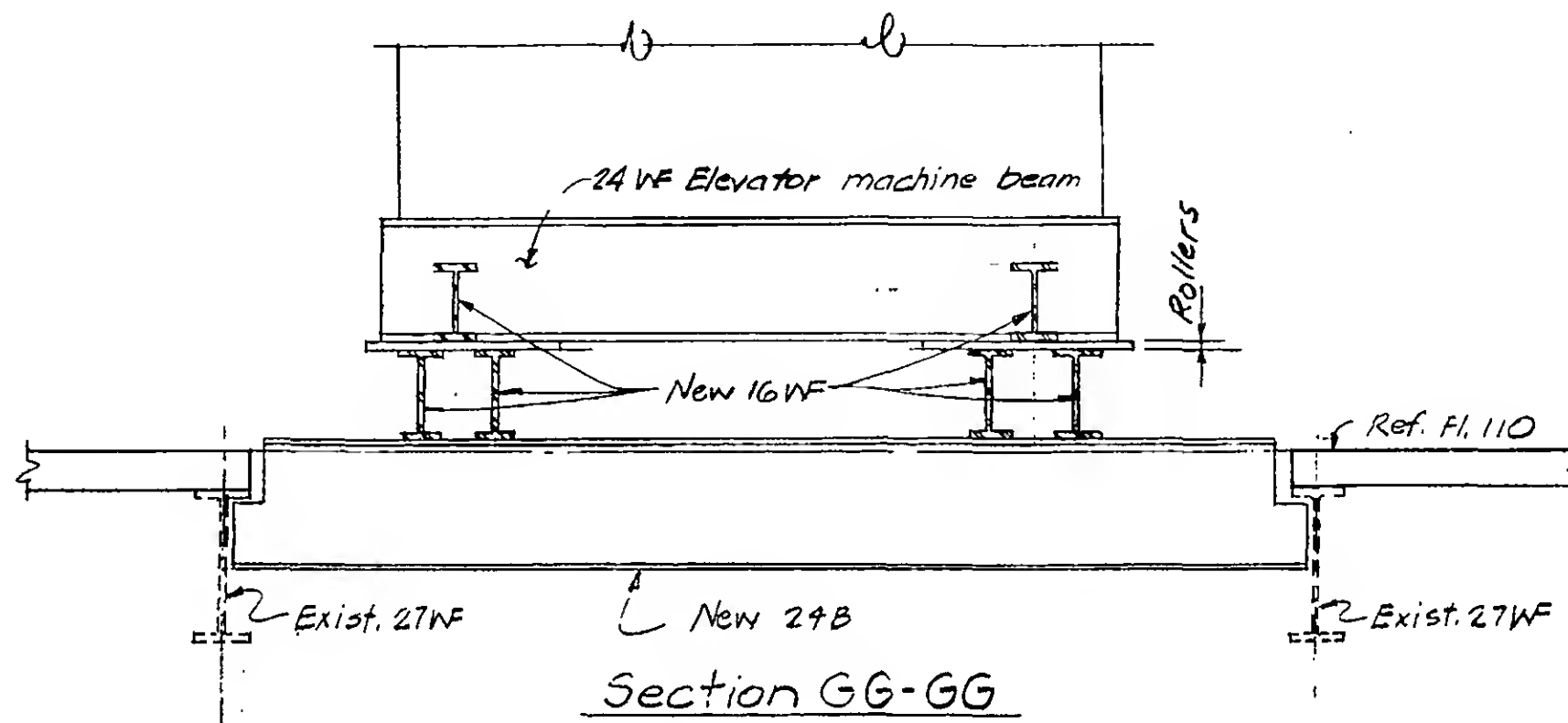
19-B-1108.17

PROJECT THE WORLD TRADE CENTER

TITLE TEMPORARY RELOCATION OF ELEV. MD MACHINE

DATE 2-28-72

REVISIONS



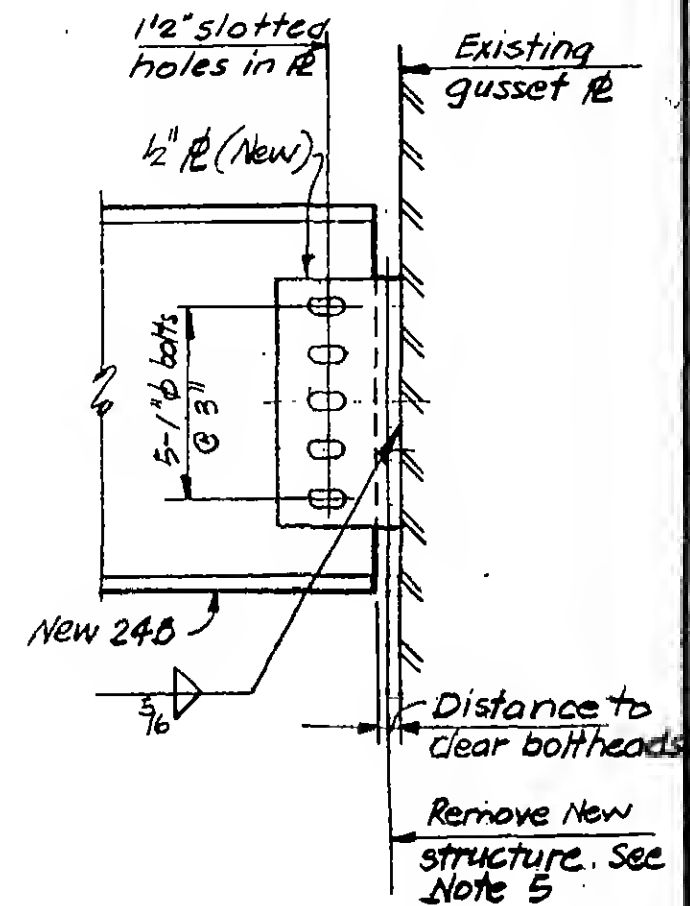
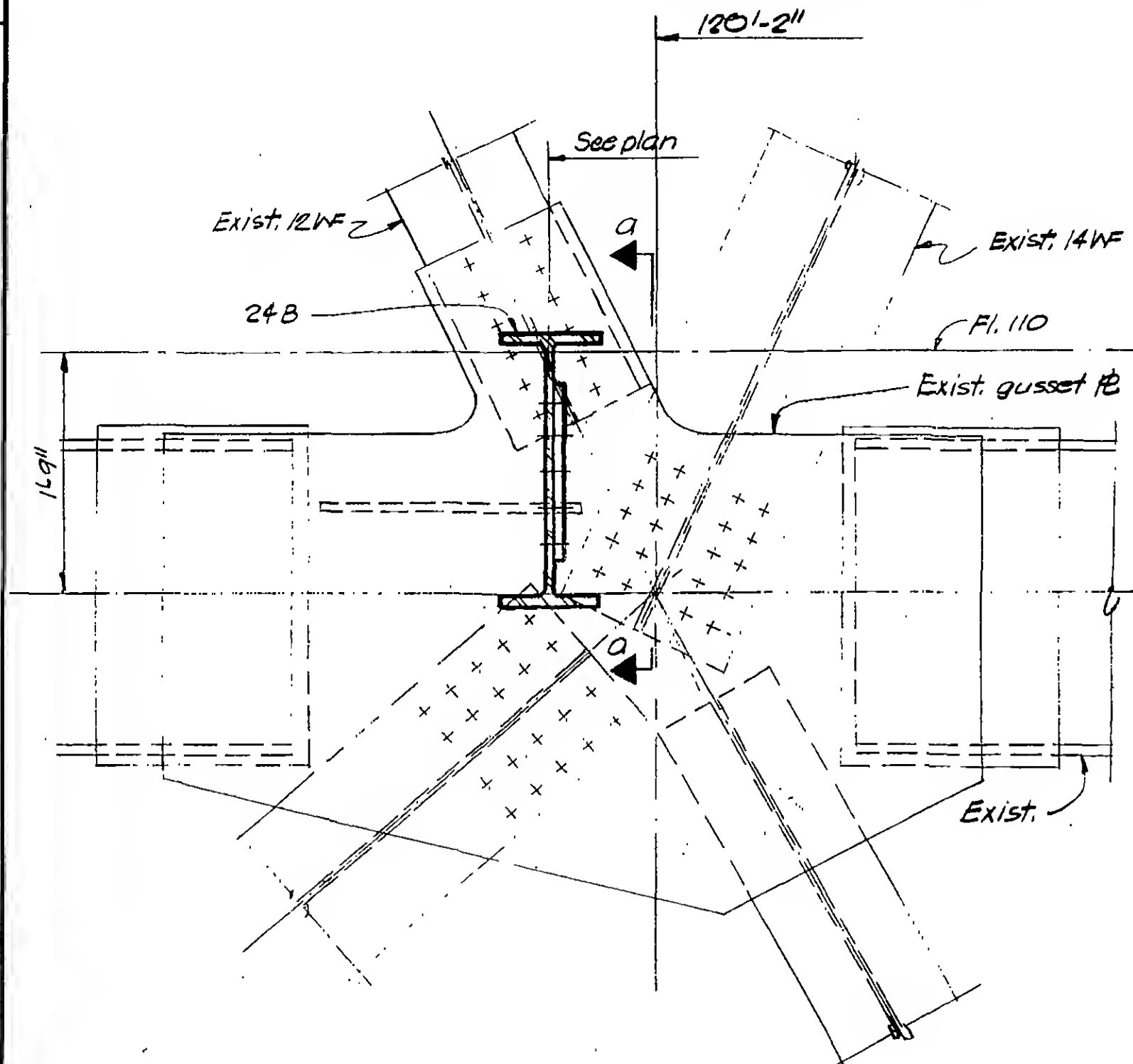
DESIGNED M. Ramani

DRAWN P.M. Ouelin

REVIEWED T. R.

19-B-110B.1B

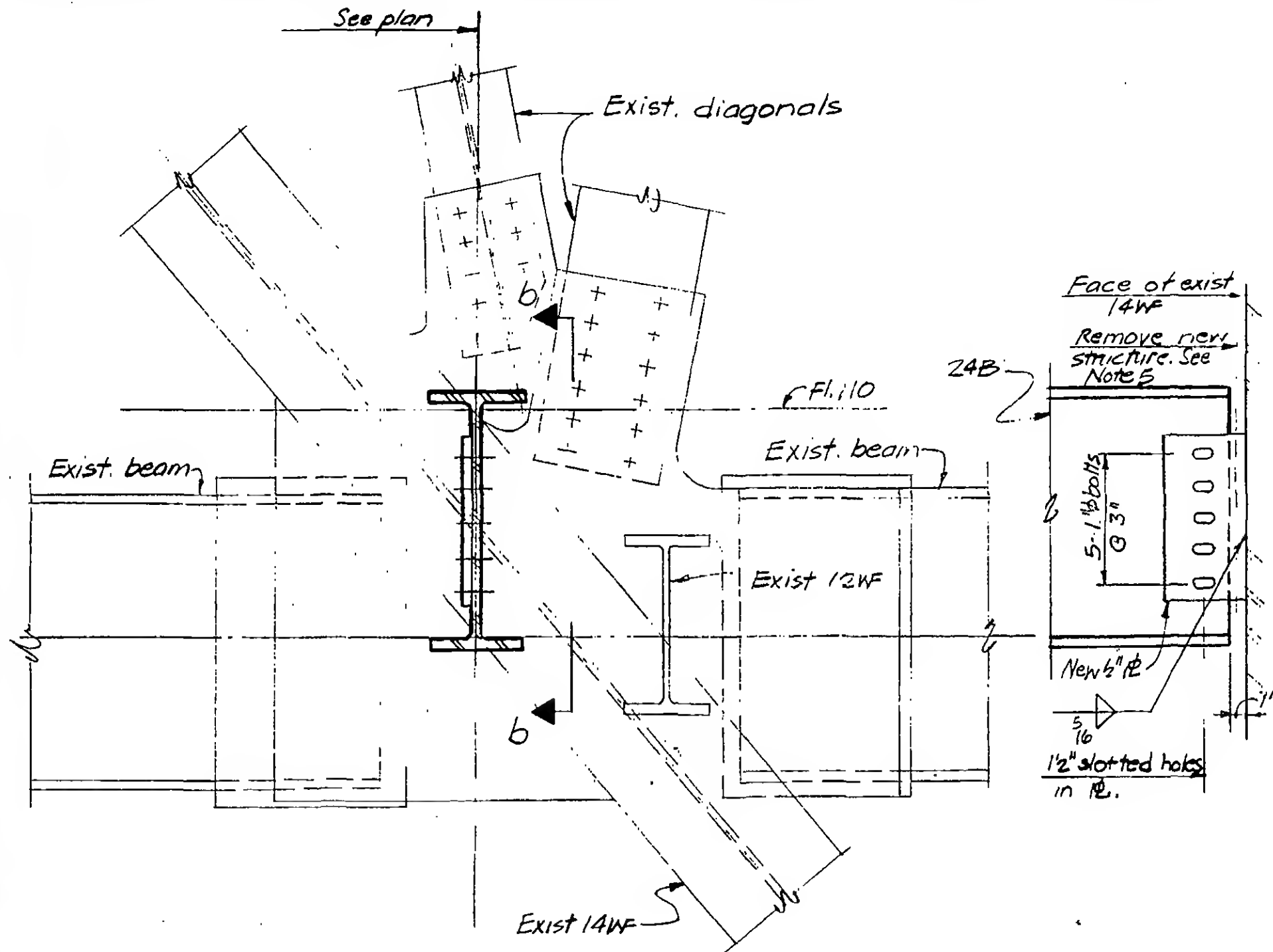
REVISIONS



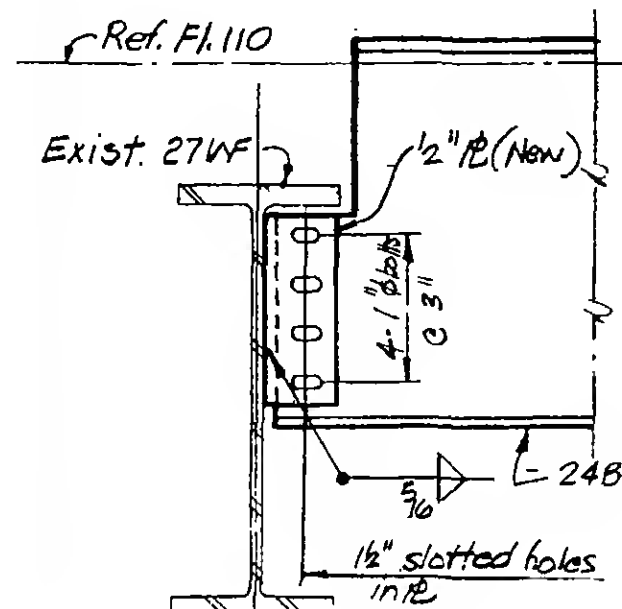
Section a-a



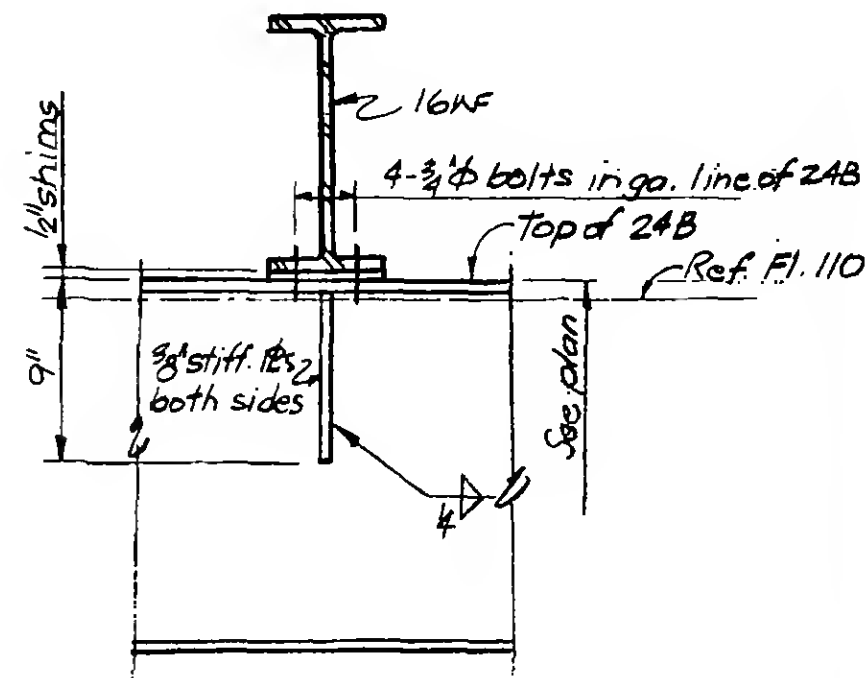
REVISIONS

Detail BBSection b-bDESIGNED
M. RamaniDRAWN
P.M. OrickREVIEWED
D. Brewer

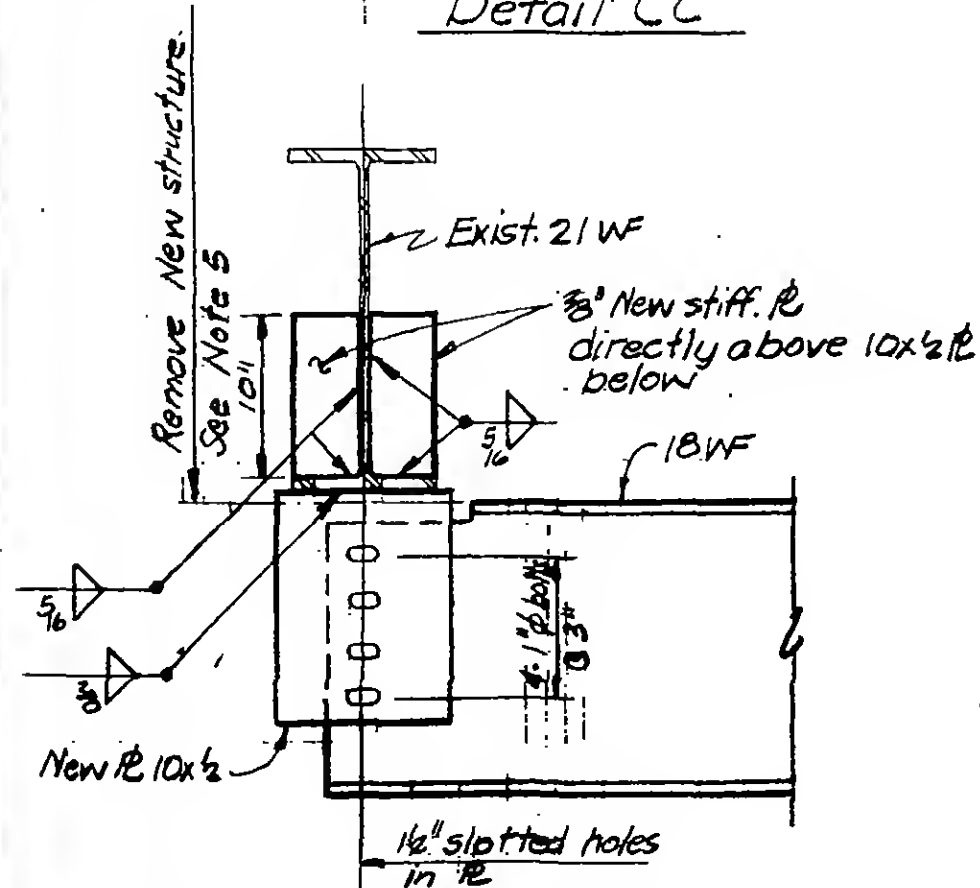
REVISIONS



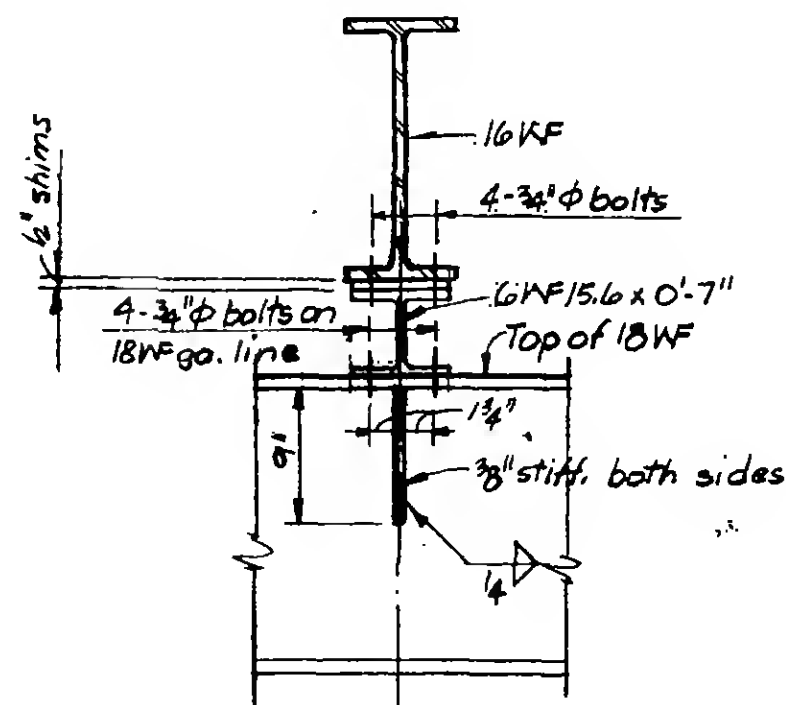
Detail CC



Detail DD



Détail EE



Detail FF



DESIGNED
M. Ramani

DRAWN
P.M. Ozeki

REVIEWED: *[Signature]*

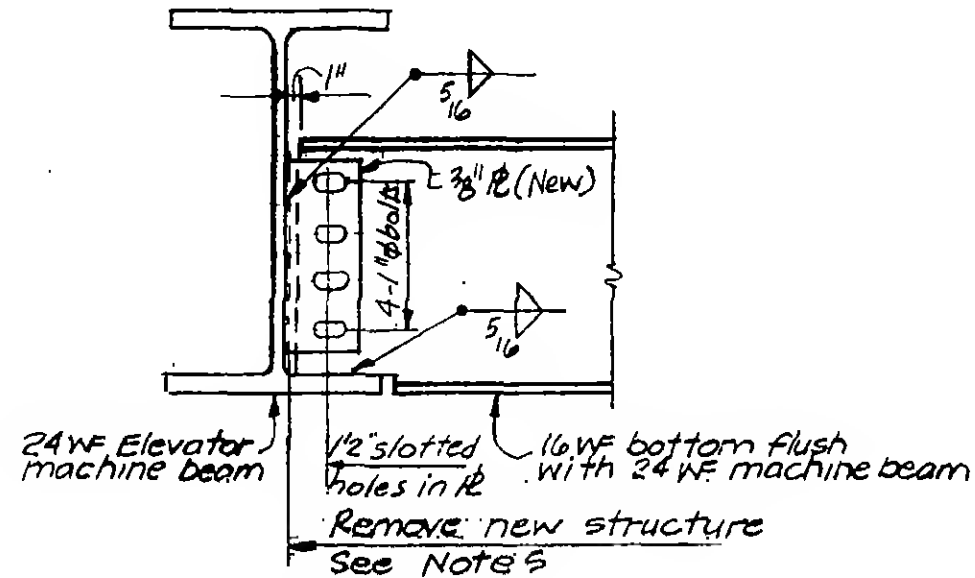
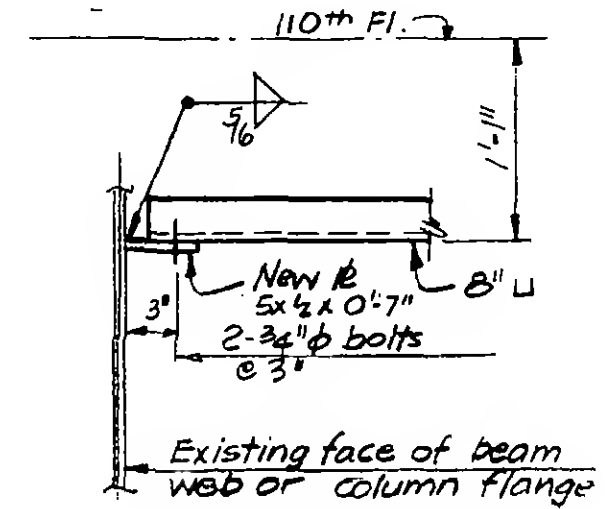
19-B-110821

PROJECT THE WORLD TRADE CENTER

TITLE TEMPORARY RELOCATION OF ELEVATOR MACHINE

DATE 2-28-72

REVISIONS

Detail G GDetail H HDESIGNED
M. RamaniDRAWN
P.M. OculiREVIEWED
J.D. Brewer

19-B-1108.22

SKILLING, HELLE, CHRISTIANSEN, ROBERTSON

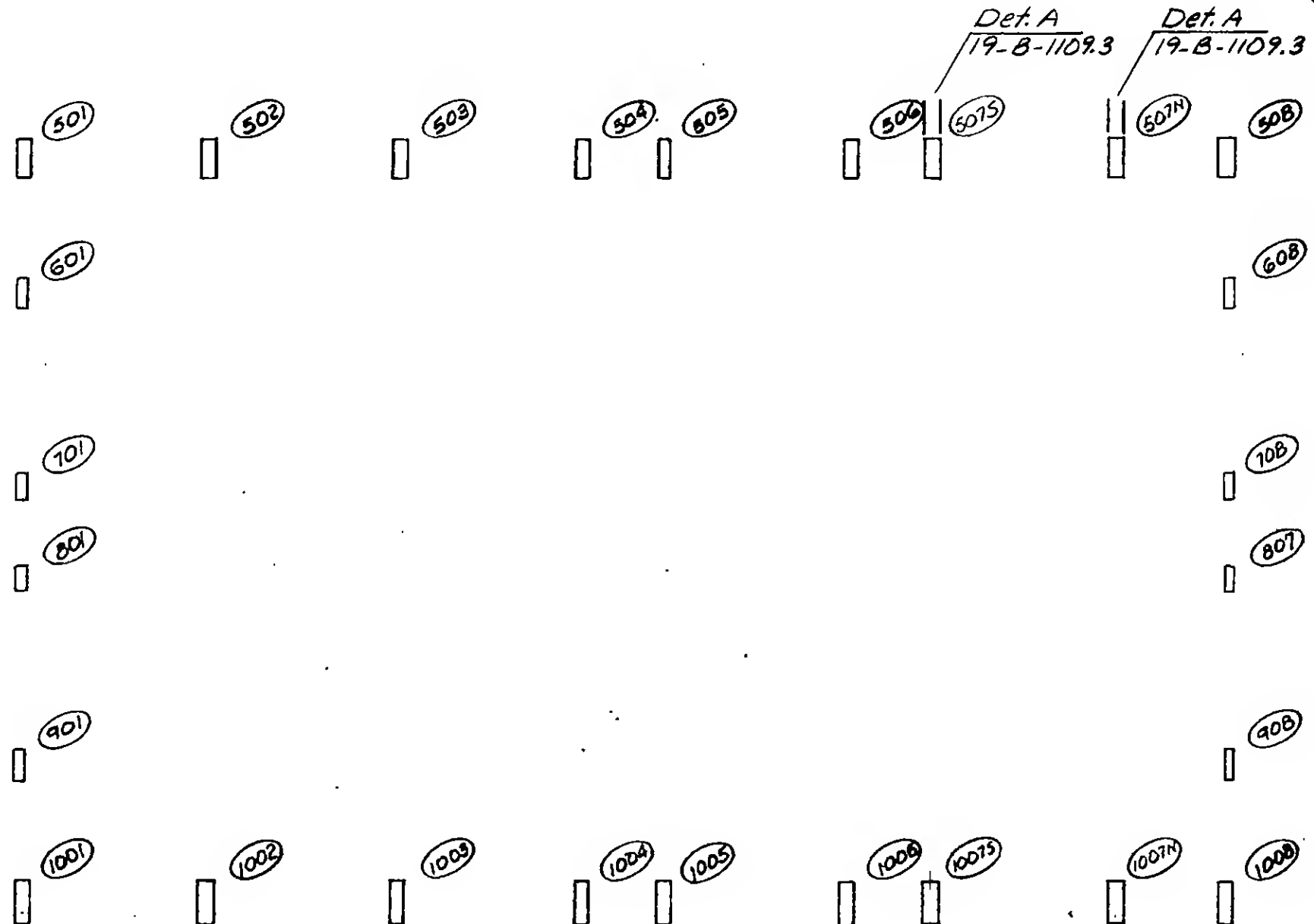
Structural & Civil Engineers

PROJECT THE WORLD TRADE CENTER

TITLE STRAP ANCHORS-KEY PLANS-EL. 264 TOWER B

DATE 1-25-72

REVISIONS



DESIGNED

DRAWN

REVIEWED
10/1/72

19-B-1109.1

SKILLING, HELLE, CHRISTIANSEN, ROBERTSON

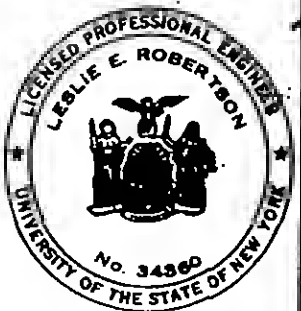
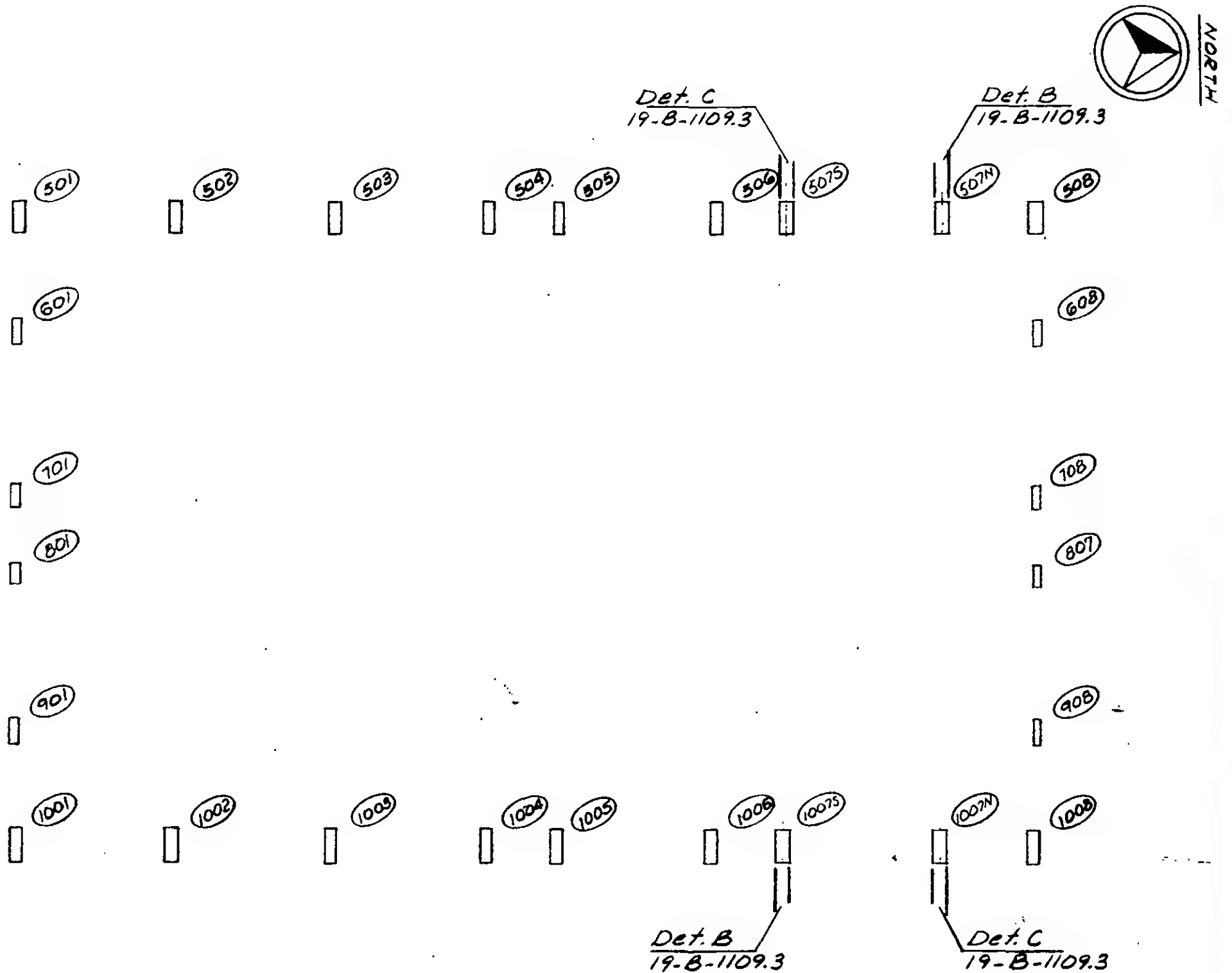
Structural & Civil Engineers

PROJECT THE WORLD TRADE CENTER

TITLE STRAP ANCHORS-KEY PLANS-EL.274 TOWER B

DATE 1-25-72

REVISIONS



DESIGNED

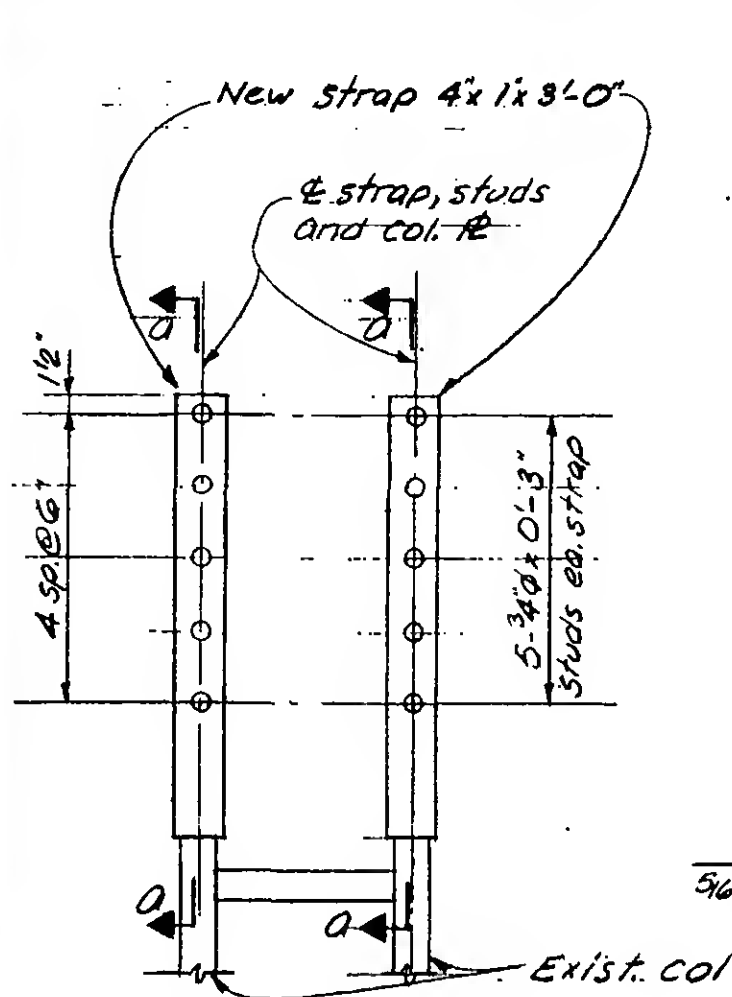
DRAWN

REVIEWED

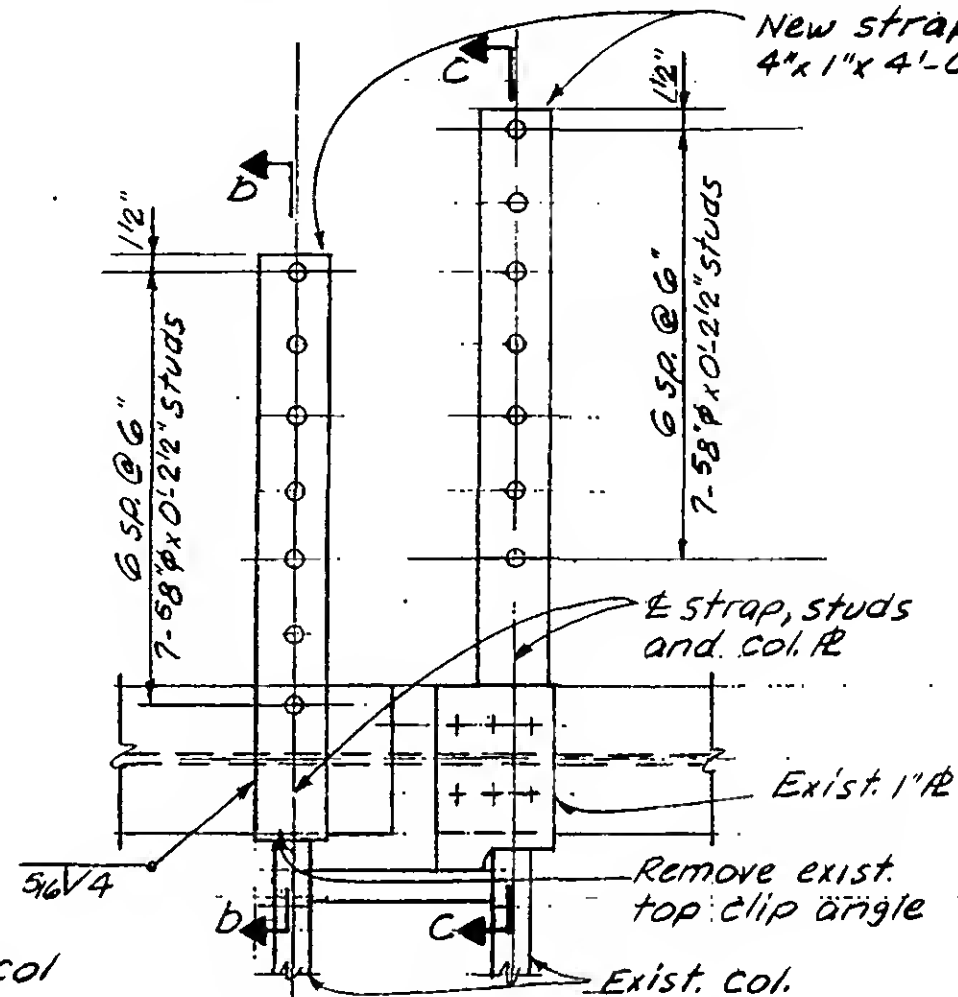
M. Brewer

19-B-1109.2

REVISIONS

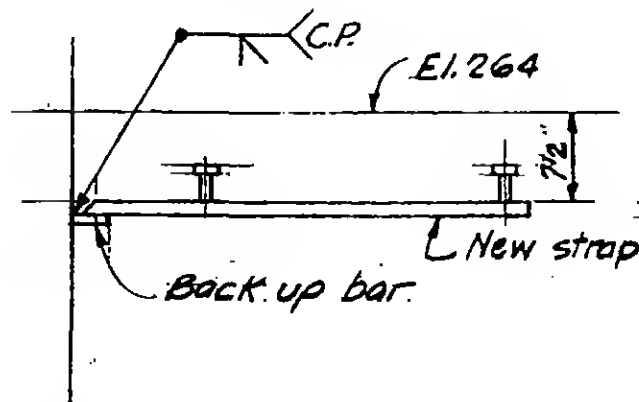


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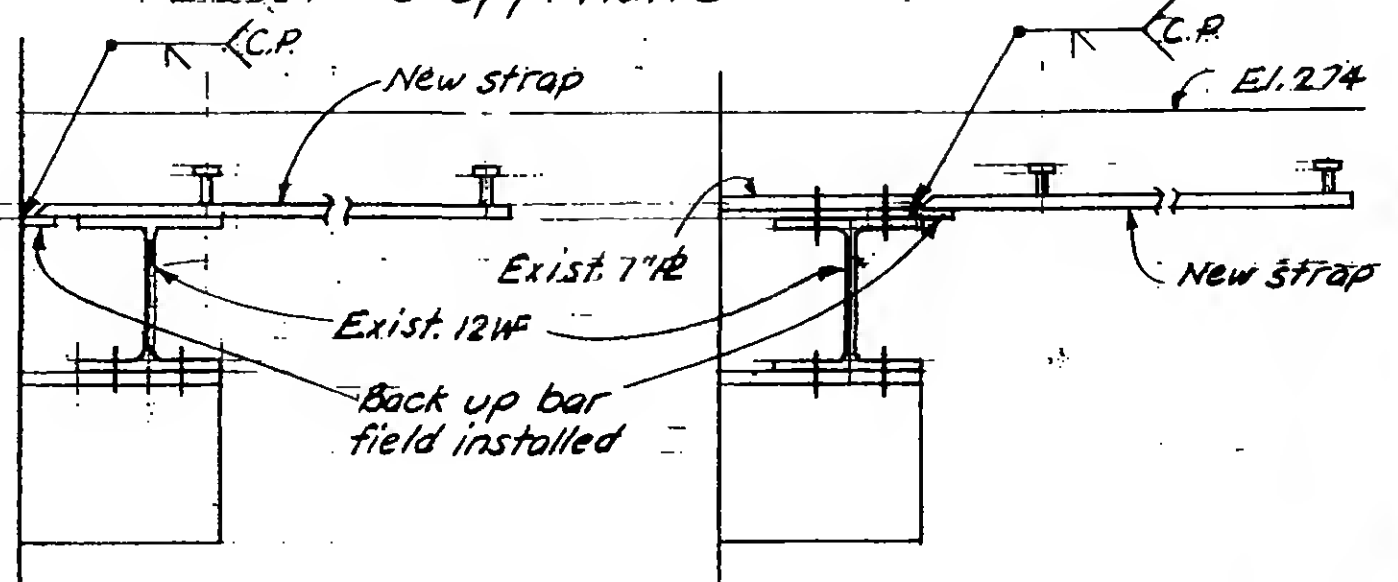


Detail B

Detail C opp. hand



Section A-A



Section B-B

Section C-C



DESIGNED

WAB

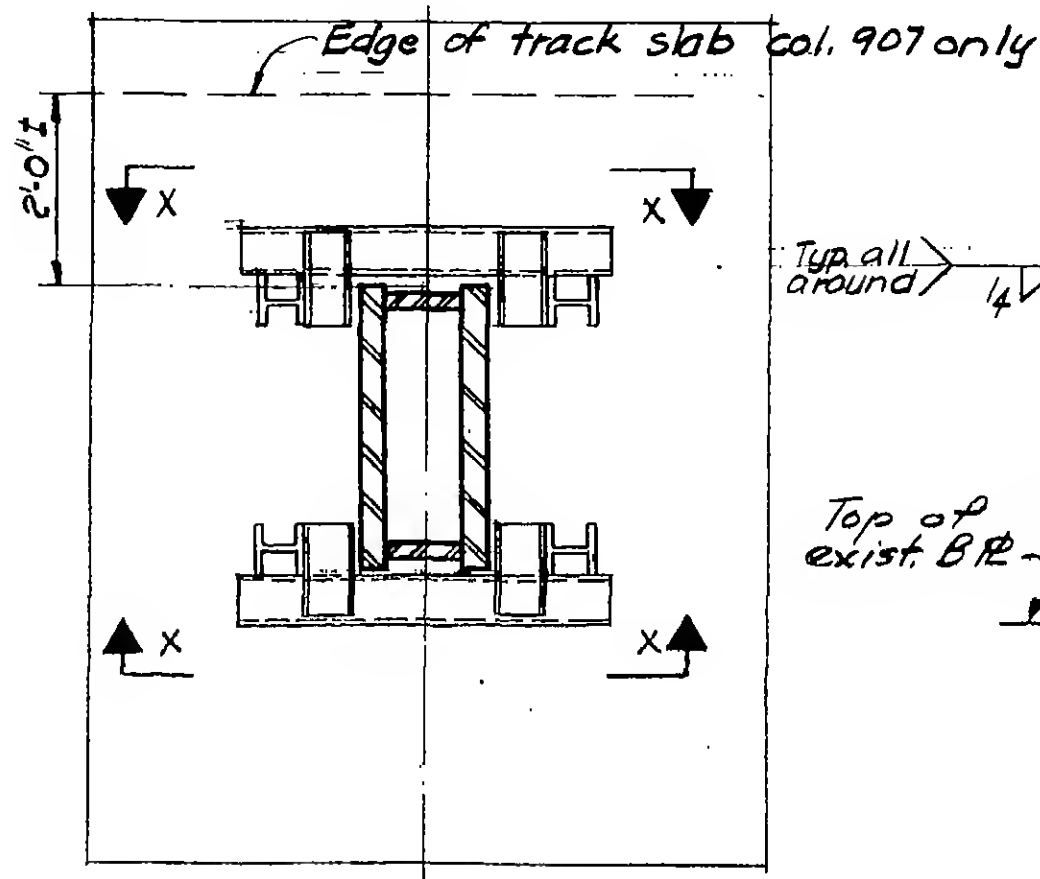
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ALF

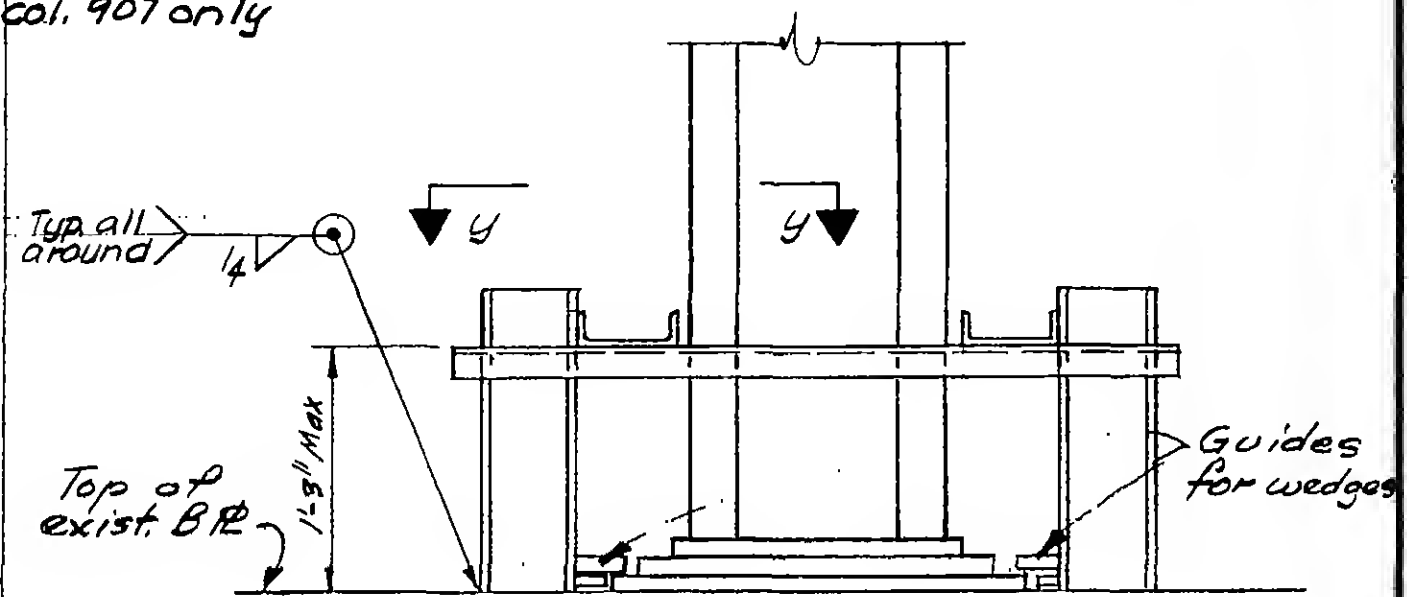
REVIEWED

110 Brawa

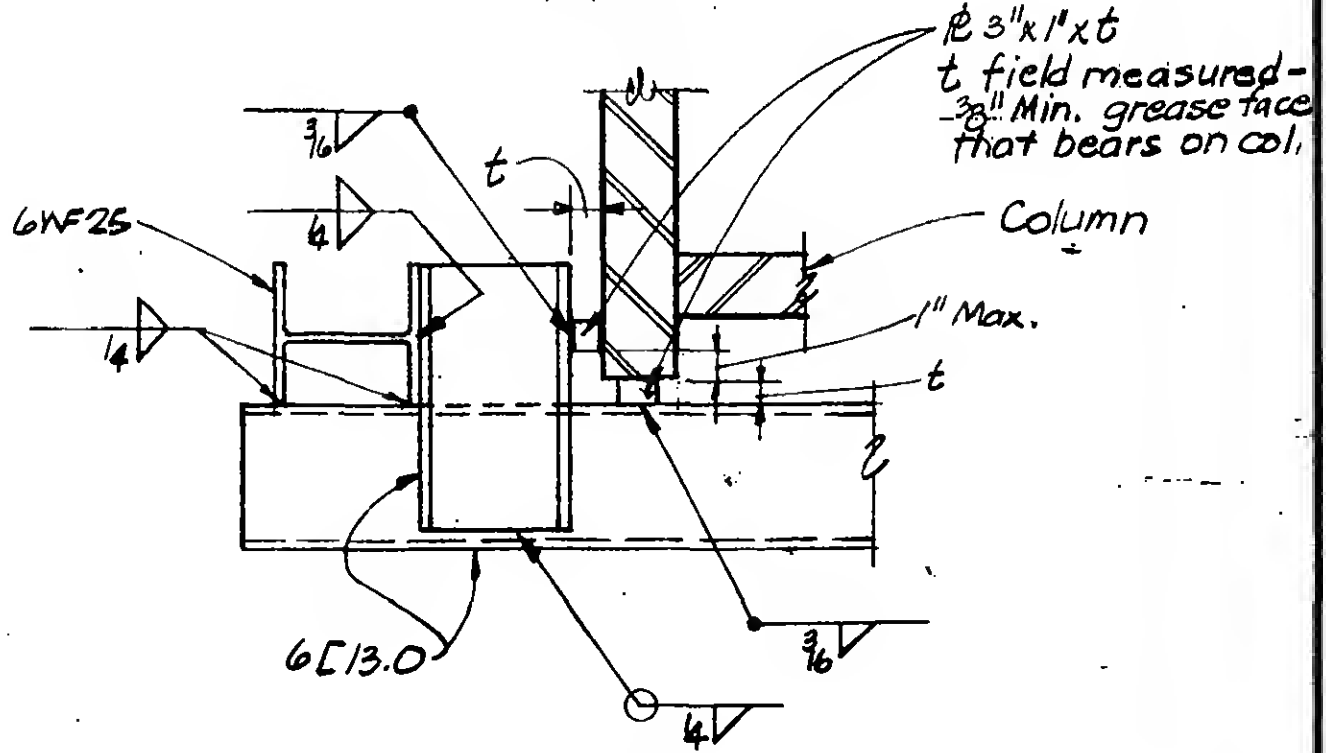
REVISIONS



Plan at Base of
Col. 607B & 907B
1/2" = 1'-0"



Section x-x
1" = 1'-0"



Section y-y
1/2" = 1'-0"



DESIGNED

DRAWN

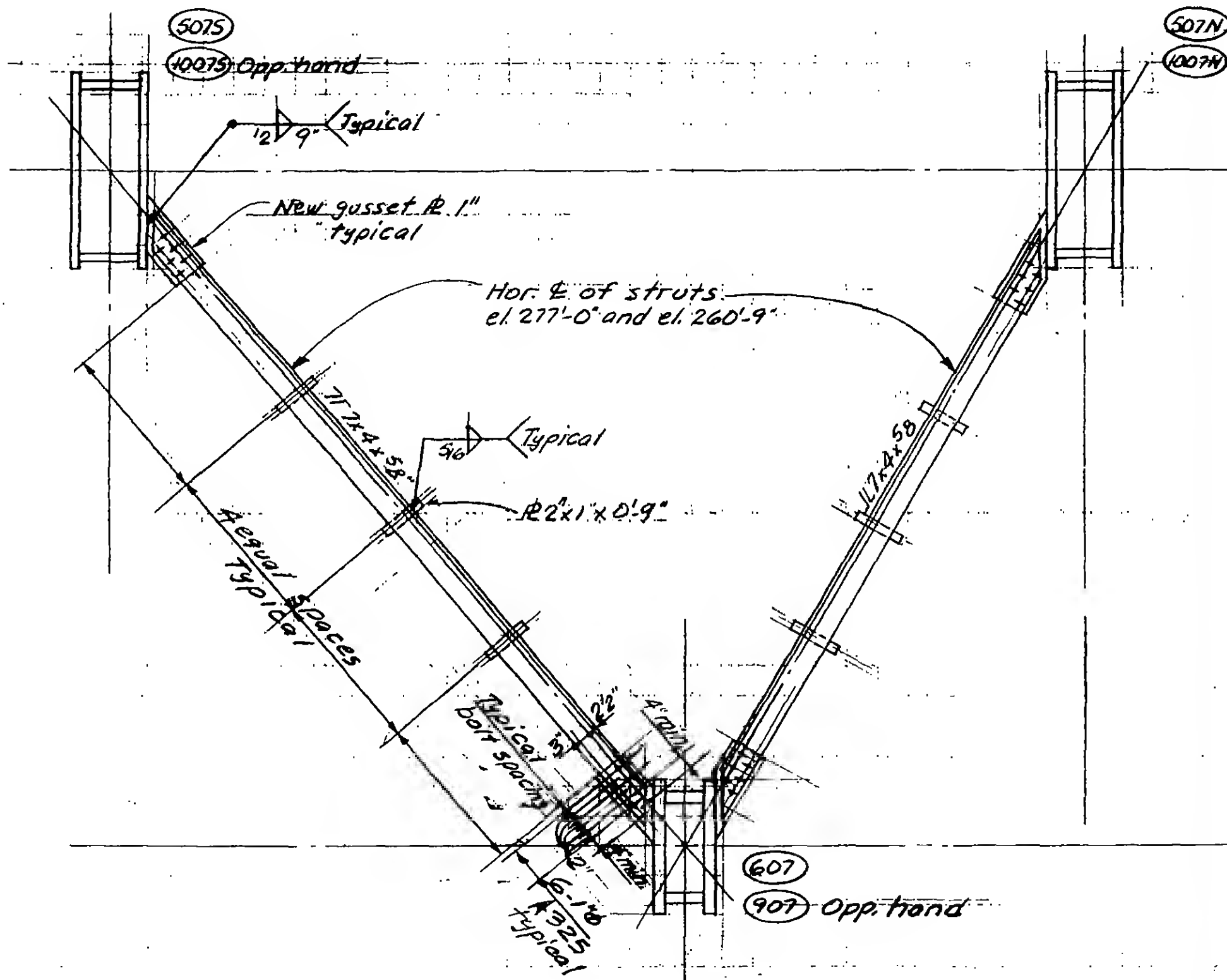
P. Ordo

REVIEWED

W. Brewer

19-B-1110

REVISIONS



DECLASSIFIED

DRAWN

A. Franqui

REVIEWED

REVIEWED
W. Brewer

19-B-1111

PROJECT

THE WORLD TRADE CENTER

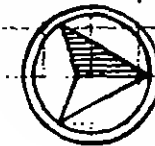
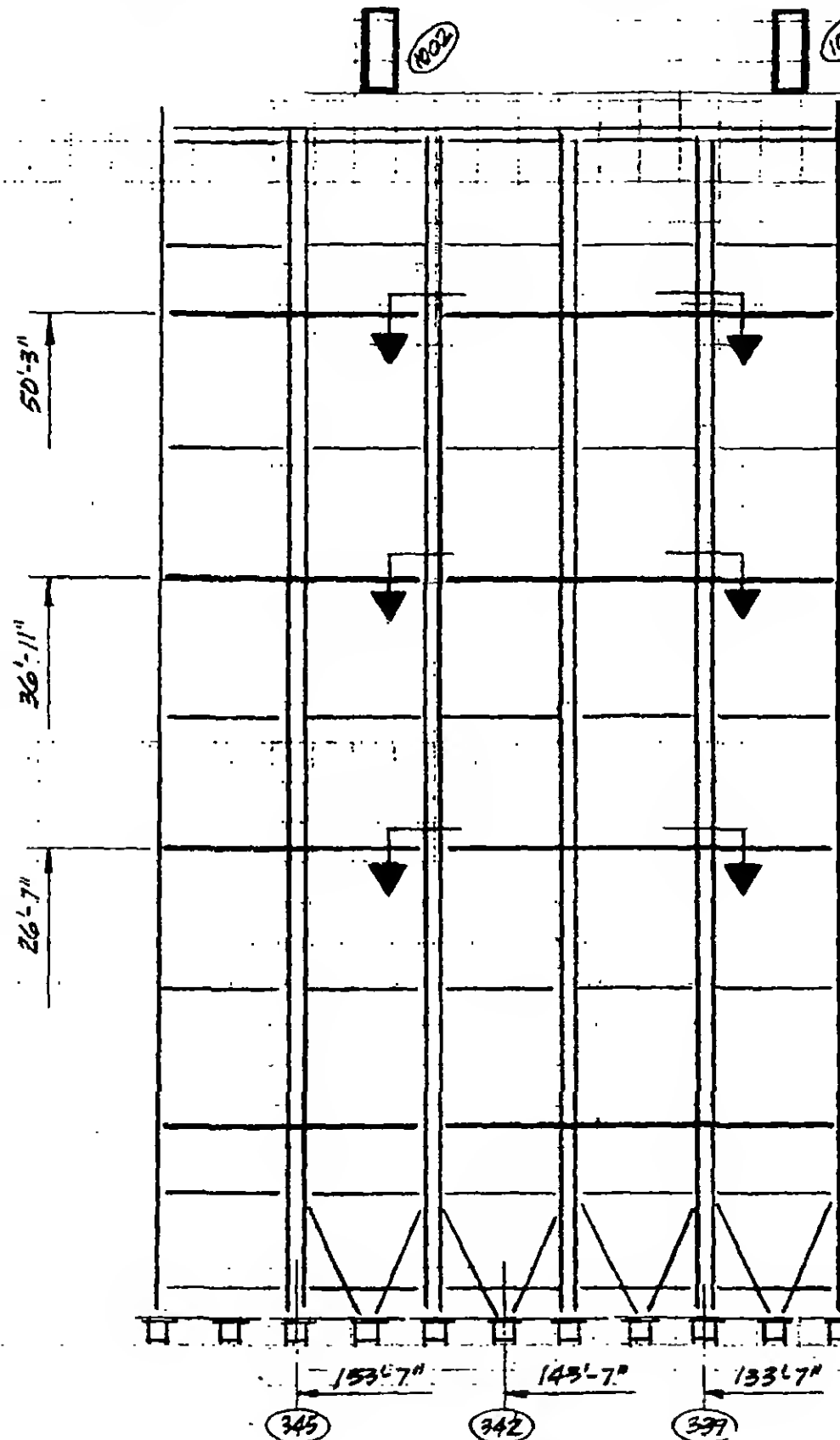
TITLE

TOWER B - FLOOR 106 PLAN

DATE

3-3-72

REVISIONS



NORTH

NOTES:

1. All work to be accomplished in accordance with project specification.
2. All new structural steel to be ASTM A36
3. All new welds to be made using E70xx low hydrogen electrode.
4. Remove exist spray fireproofing as required to accomplish new work then replace on existing and fireproof new work.
5. Where gap exists, increase fillet weld size by amount of gap.



DESIGNED

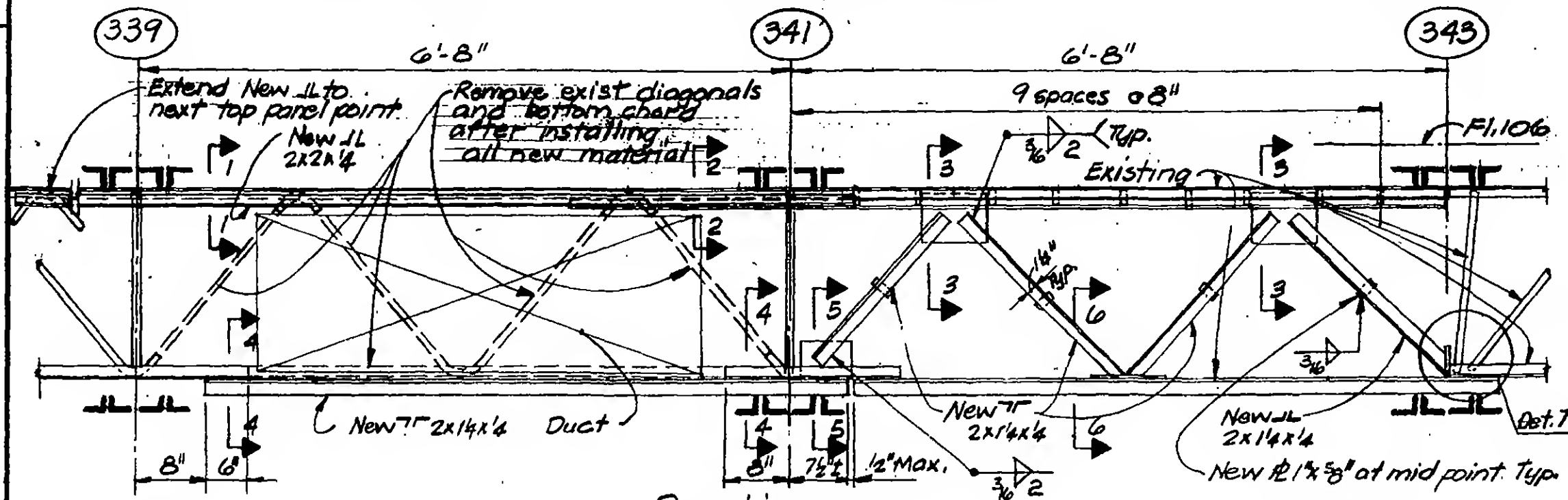
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P. Morelli

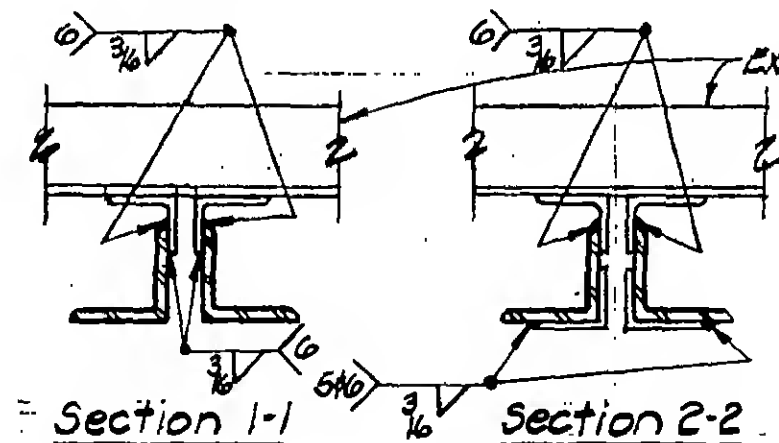
REVIEWED

19-B-1112.1

REVISIONS



Section

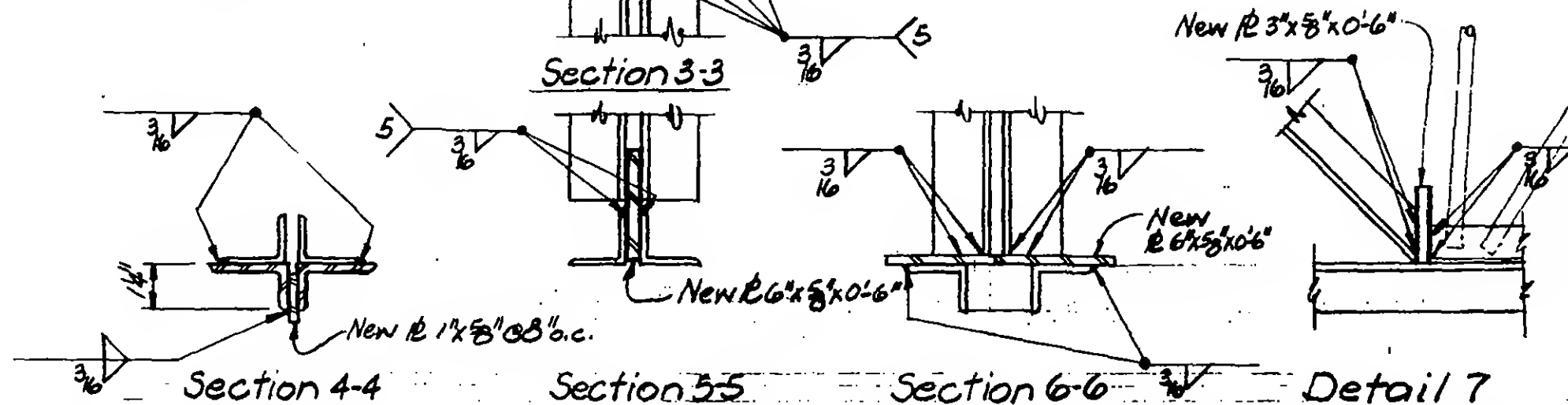


- Existing steel decks

Note 6. 6^4 at ends then
 3^4 & 12^4

- New $\phi 6'' \times 58'' \times 0'-6''$

Section 3-3



Section 4-4

Section 5-5

Section 6-6

Detail 7



DESIGNED
WAB

DRAWN
PMO/ale

REVIEWED

19-B-1112.2

PROJECT

THE WORLD TRADE CENTER

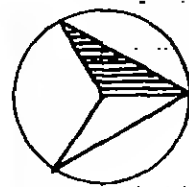
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WINDOW WASHER RAIL SUPPORT

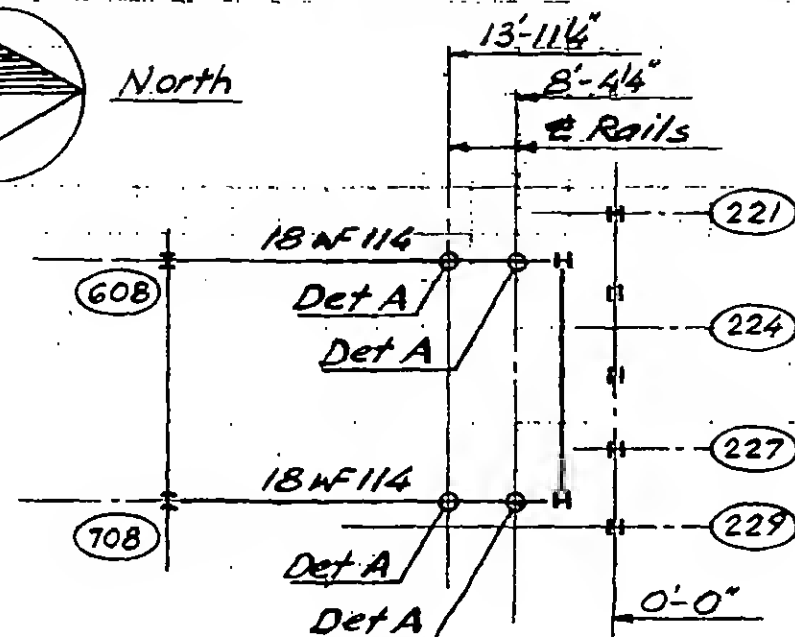
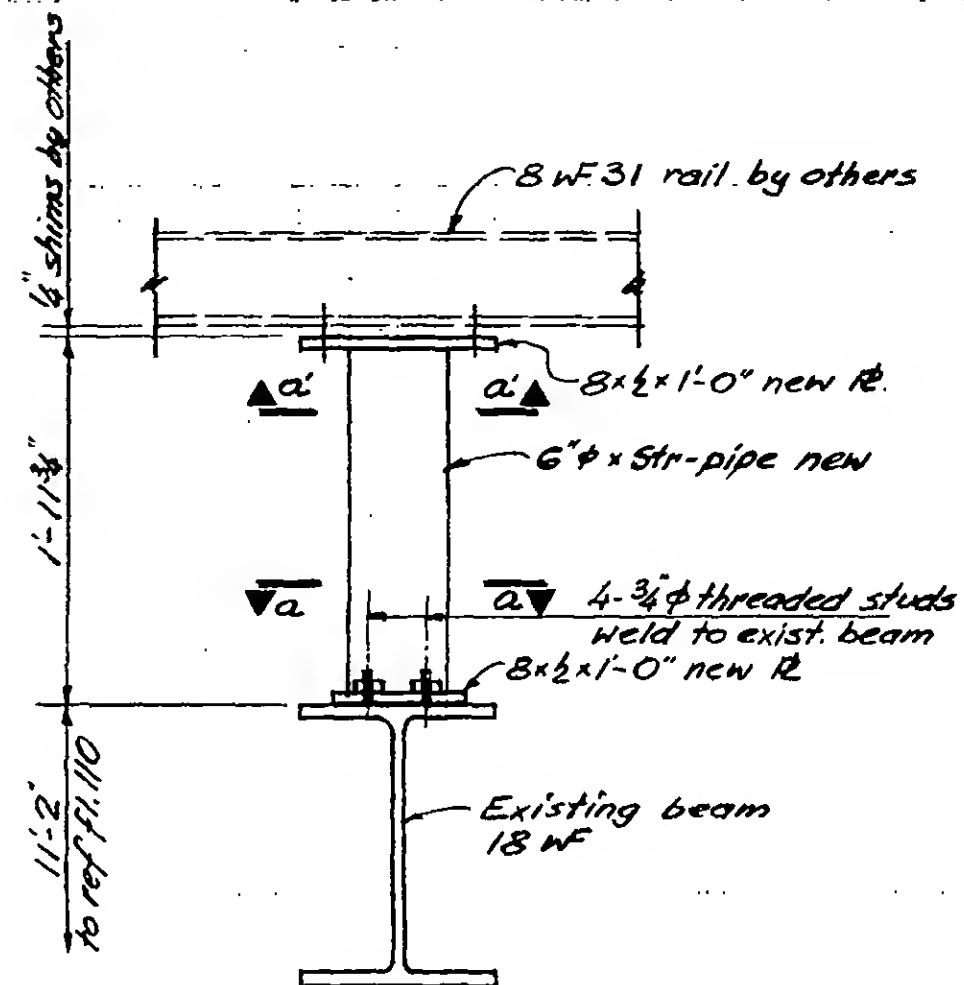
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4-19-72

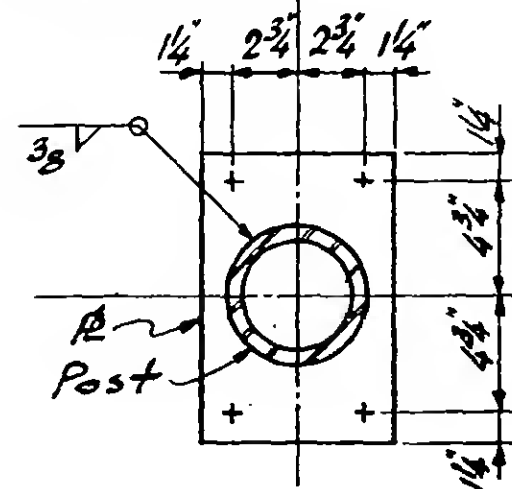
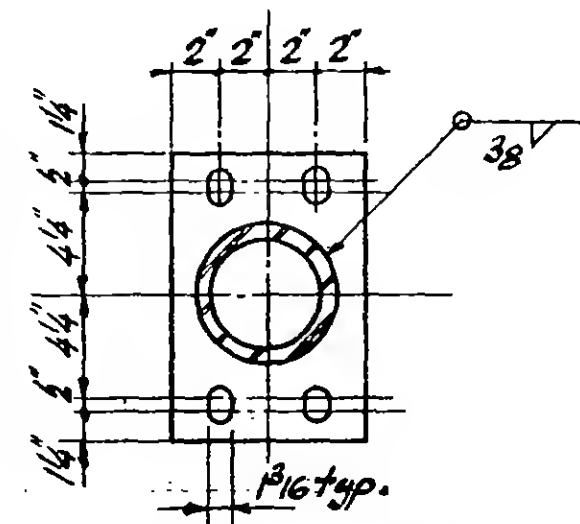
REVISIONS



North

PART PLAN P.H. LOW ROOFDetail A

± Post & 18 WF

Section a-aSection a'-a'

DESIGNED

DRAWN

REVIEWED

19-B-1113

PROJECT

THE WORLD TRADE CENTER

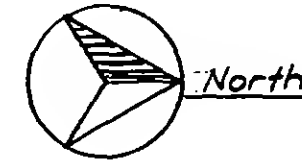
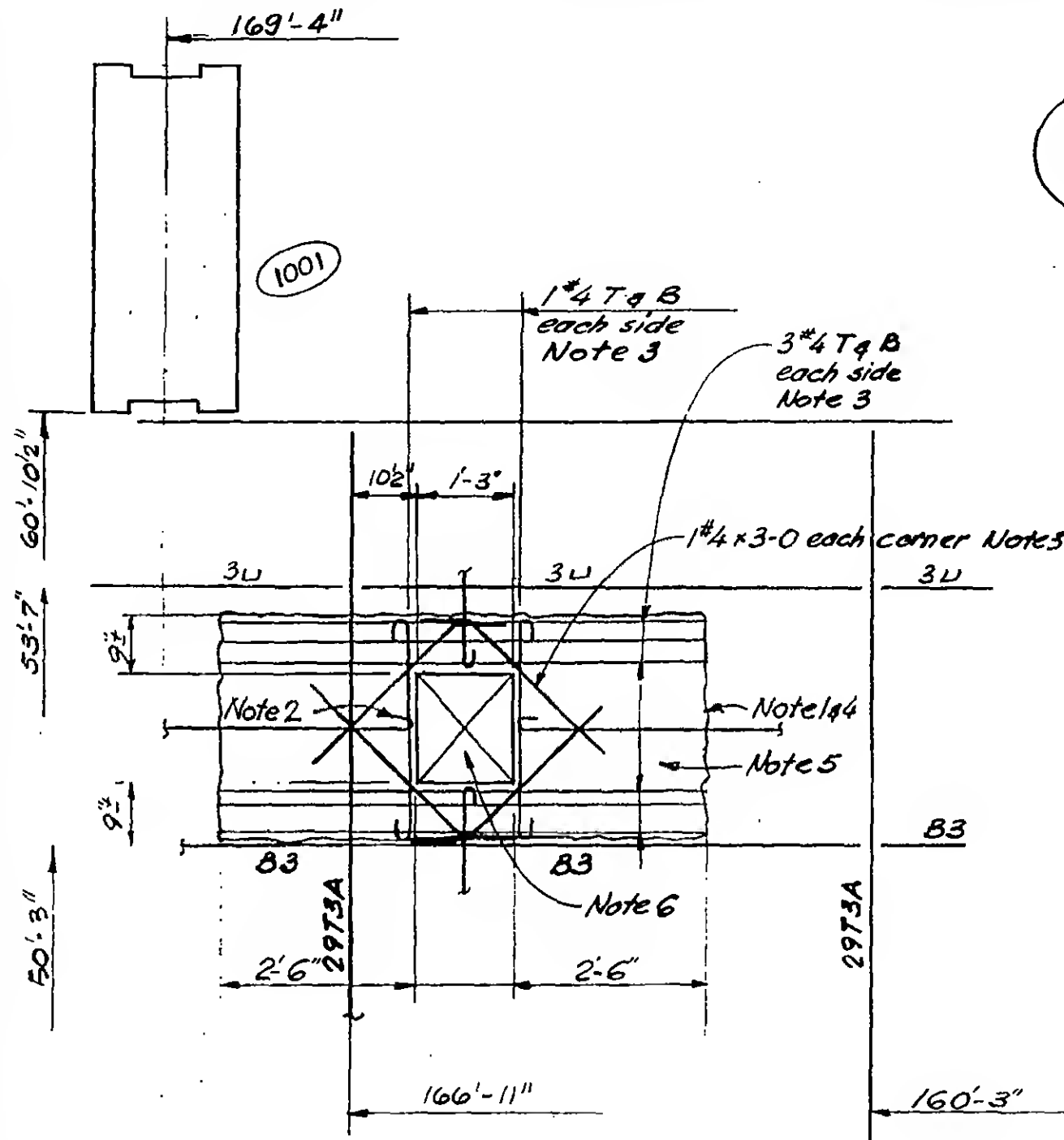
TITLE

TOWER B - FLOOR 10 NEW SLAB OPENING

DATE

4-20-72

REVISIONS



Notes:

1. Remove existing concrete to line indicated without damaging existing reinf. or exist. steel deck.
2. Cut existing reinf. and hook at edge of opening.
3. Add new reinf. as indicated
4. Clean face of exist. concrete and thoroughly coat entire surface with epoxy bonding compound.
5. Cast slab to edge of new opening using approved "non-shrink" $f_c = 4000$ psi concrete.
6. Remove steel deck after new concrete has been cast & cured.

Part Plan

See JBB drawing MB-23 Bull. B-152



DESIGNED

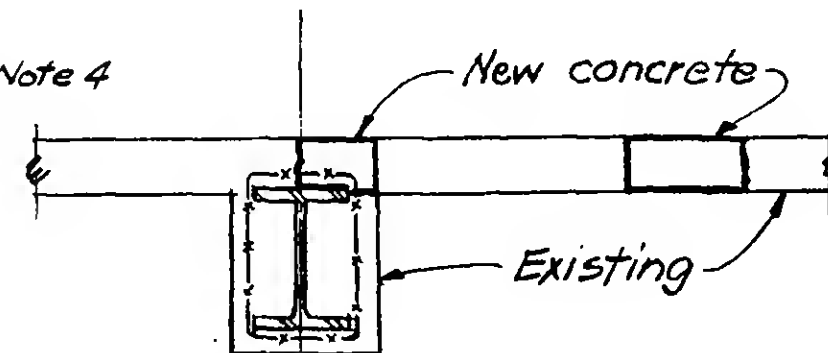
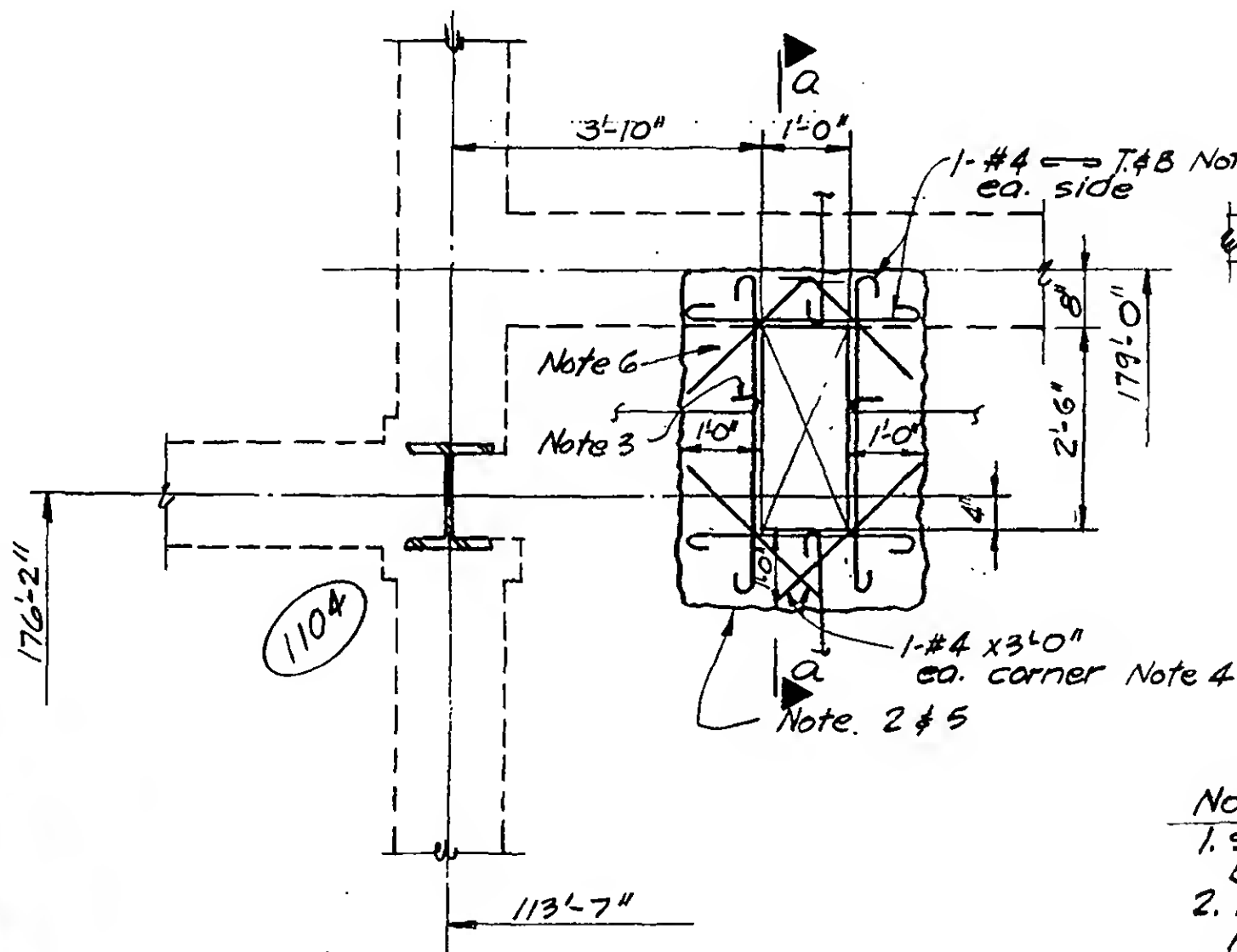
DRAWN

PMOreli

REVIEWED

19-B-1114

REVISIONS



Section a-a

Part Plan

See M-B-10 dated 6-1-72 Bul. No. B-163

Notes:

1. Slabs to be shored as required before removing exist. concrete.
2. Remove existing concrete to line indicated without damaging existing reinf.
3. Cut existing reinf. and hook at edge of opening.
4. Add new reinf. as indicated.
5. Clean face of existing concrete and thoroughly coat entire surface with epoxy bonding compound.
6. Cast slab to edge of new opening using approved "non-shrink" $f_c = 4000$ psi concrete.

19-B-1115.1



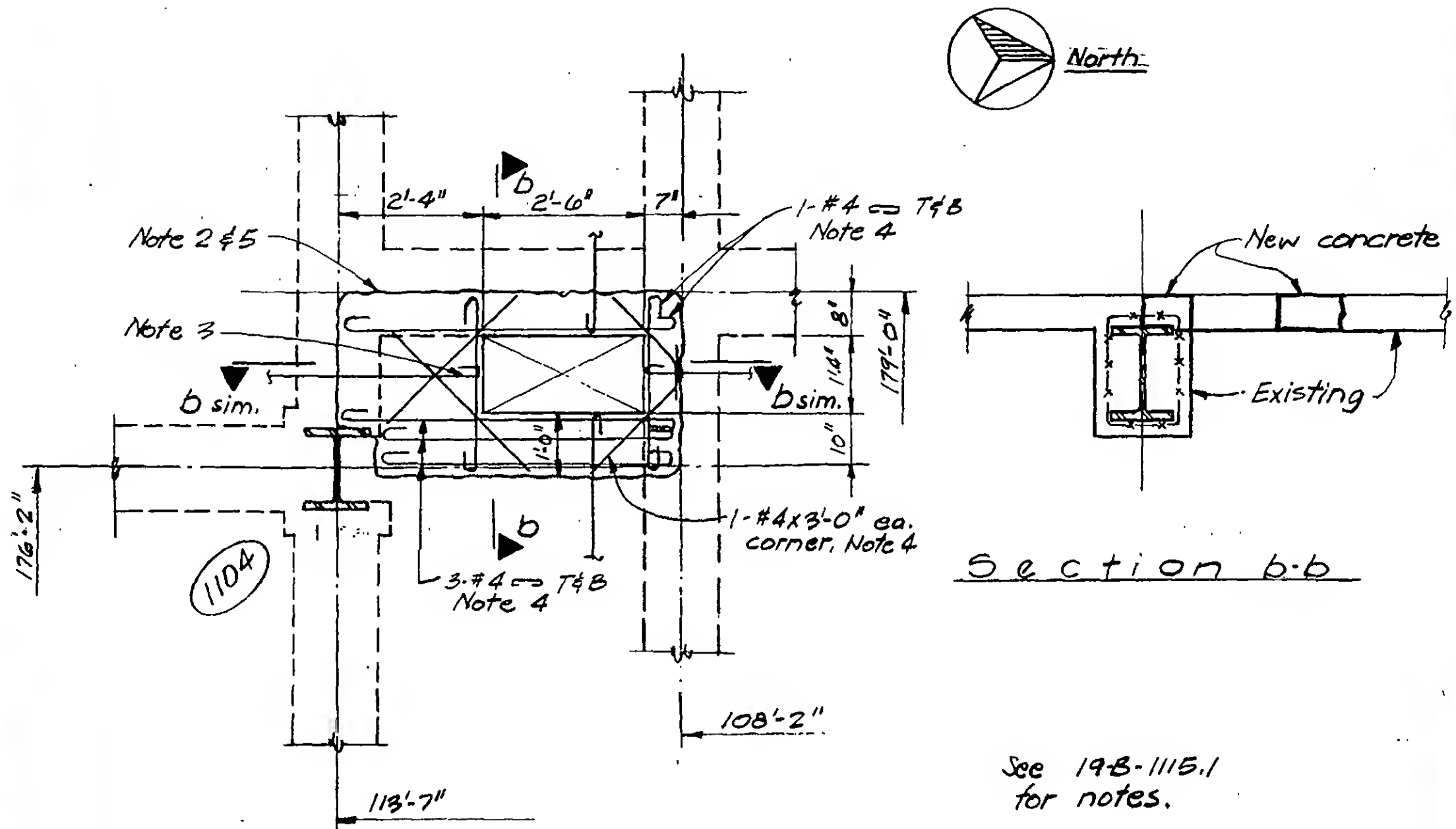
DESIGNED

DRAWN

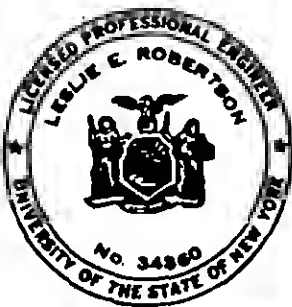
P. M. Orski

REVIEWED

REVISIONS

Part Plan

See M-B-11 dated 6-1-72 Bul. No B-163



DESIGNED

DRAWN

P.H. O'Brien

REVIEWED

19-B-1115.2

PROJECT

THE WORLD TRADE CENTER

TITLE

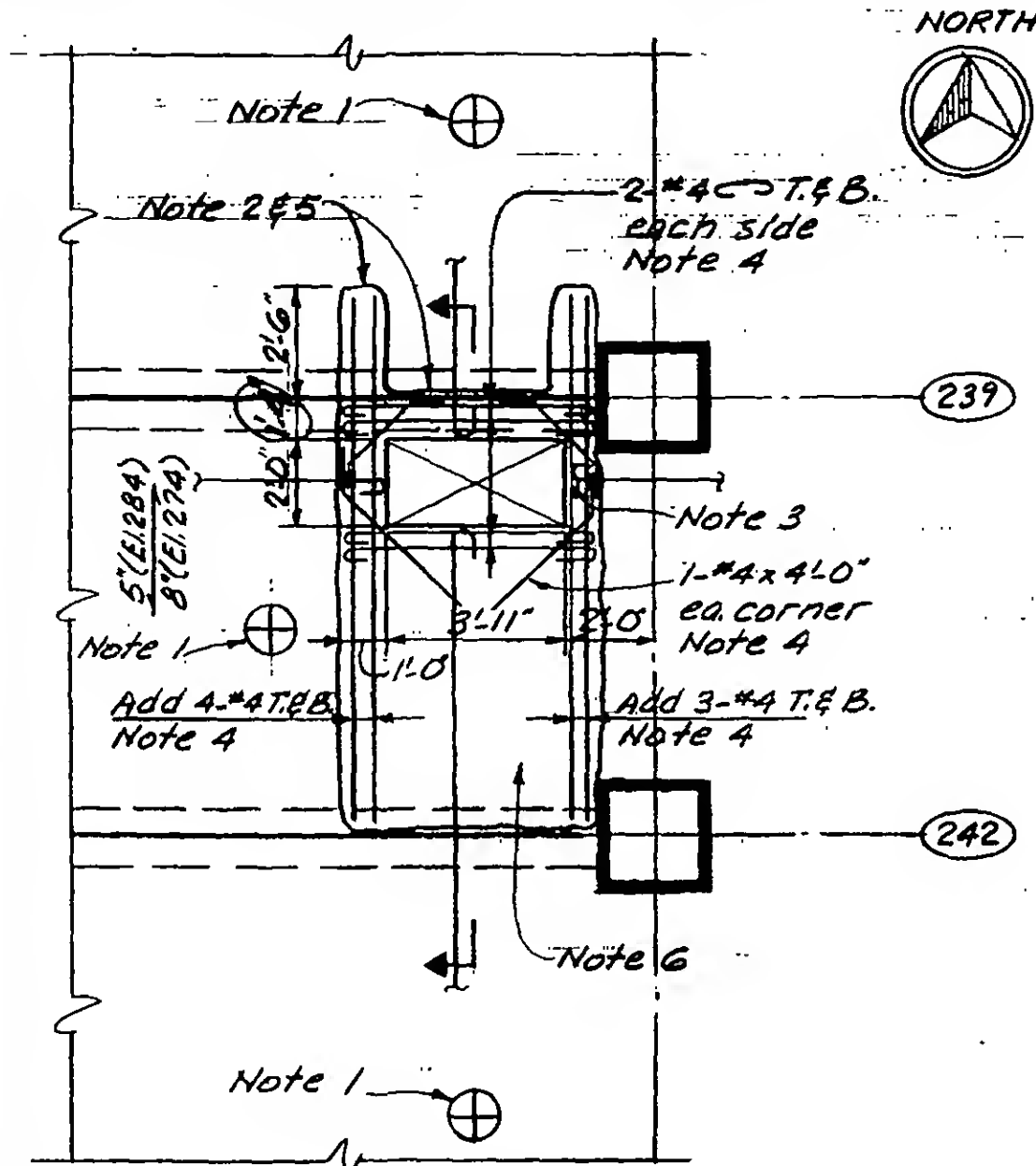
NEW OPENING PATH K.E.

DATE

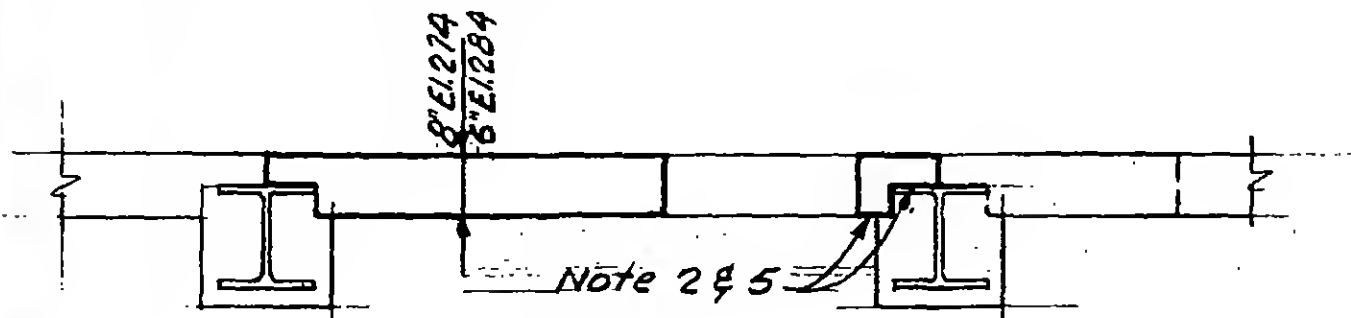
6-5-72

REVISIONS

12-21-72

Notes:

1. Slabs to be shored as required before removing exist. concrete.
2. Remove existing concrete to line indicated without damaging exist. reinf.
3. Cut exist. reinf. and hook at edge of opening.
4. Add new reinf. as indicated.
5. Clean face of exist. concrete and thoroughly coat entire surface with epoxy bonding compound.
6. Cast slab to edge of new opening using approved "non-shrink" $f_c = 4000$ psi concrete.

Part Plan E1.274 & 284Section

DESIGNED

WAB

DRAWN

A. Franqui

REVIEWED

19-AK-1116

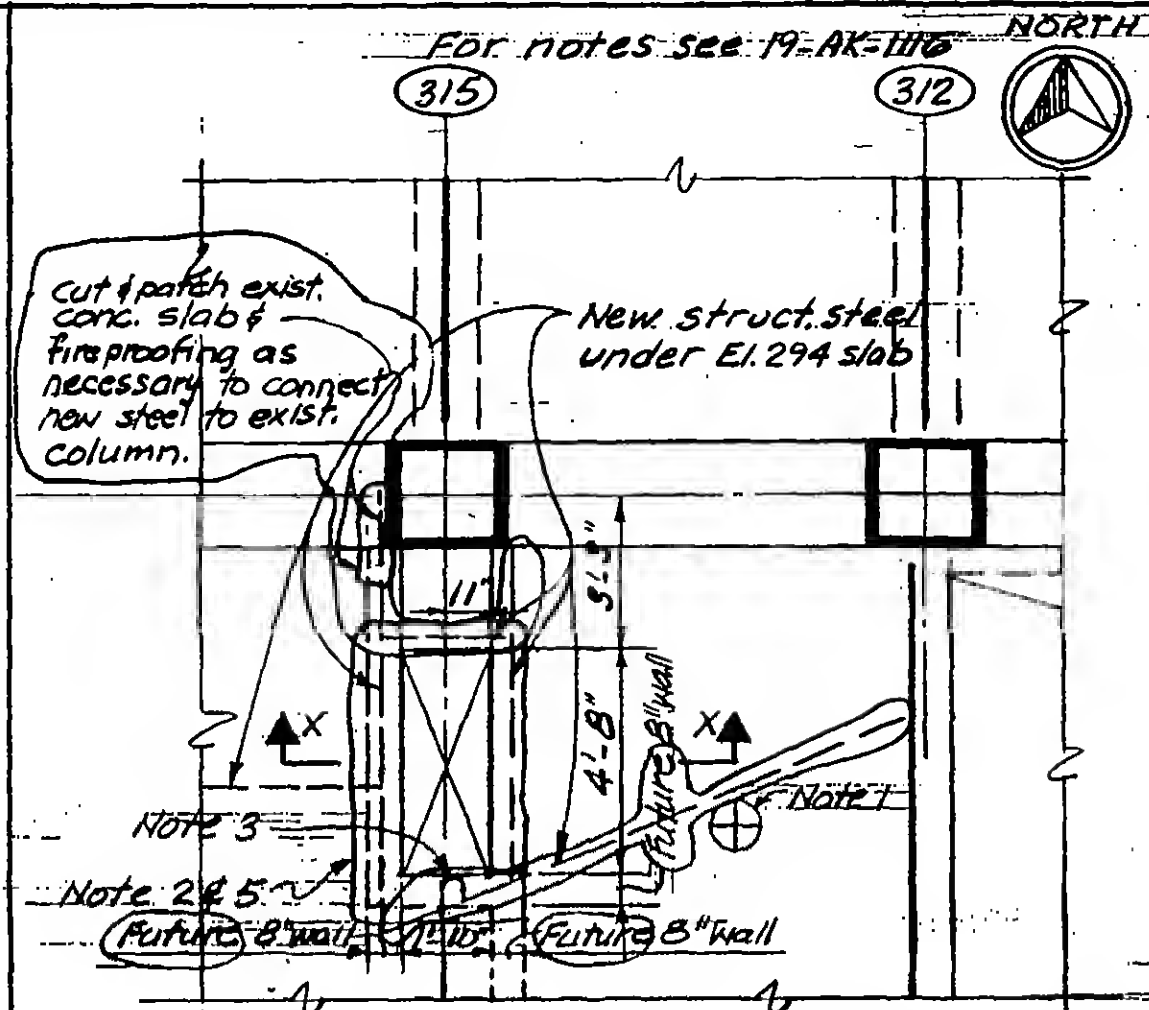
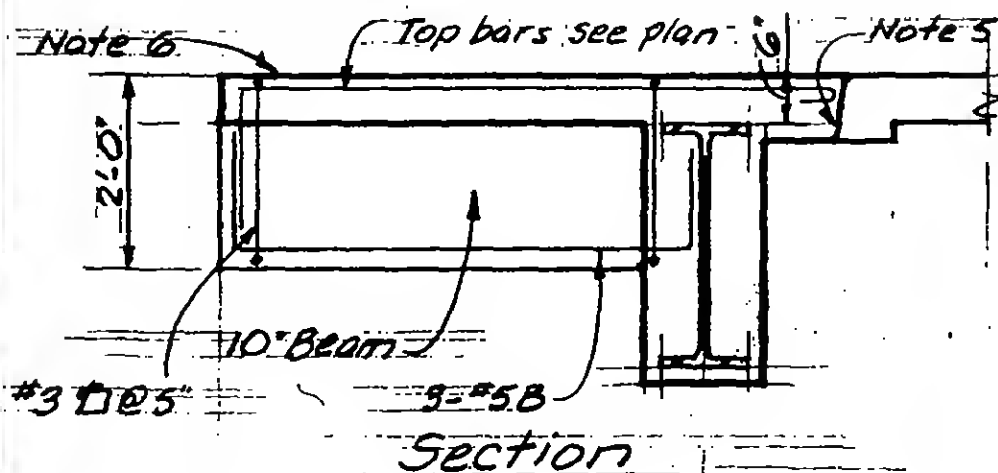
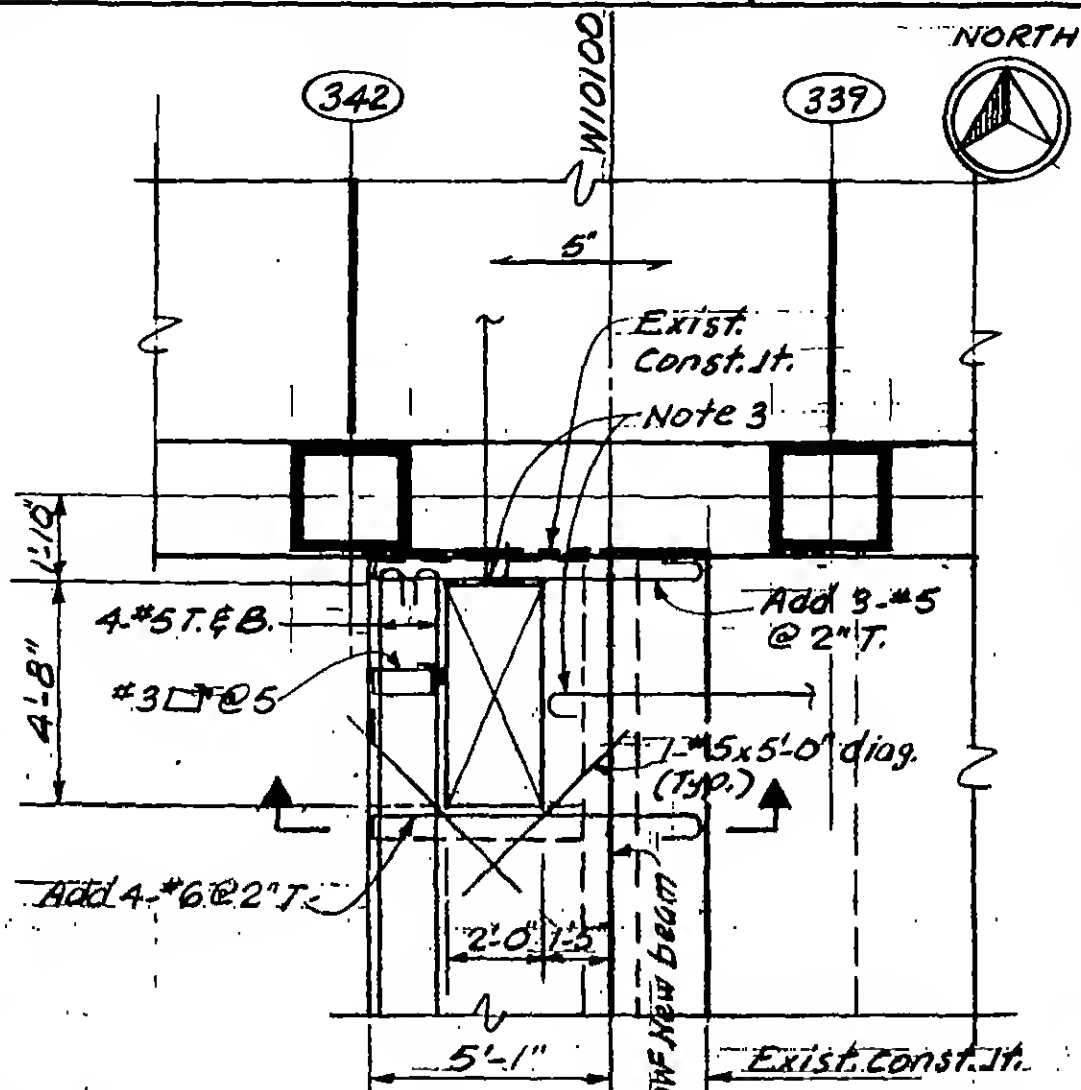
PROJECT THE WORLD TRADE CENTER

TITLE NEW OPENINGS - PATH KE

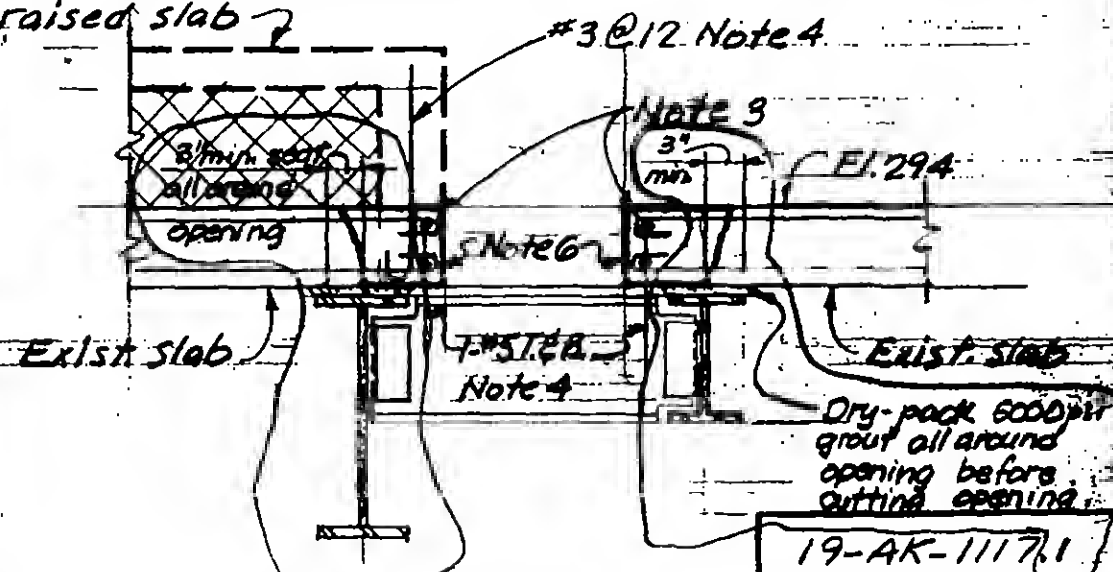
DATE 6-5-72

REVISIONS

12-21-72



Future Commissary raised slab



DESIGNED WAB

DRAWN A. Franqui

REVIEWED

PROJECT

THE WORLD TRADE CENTER

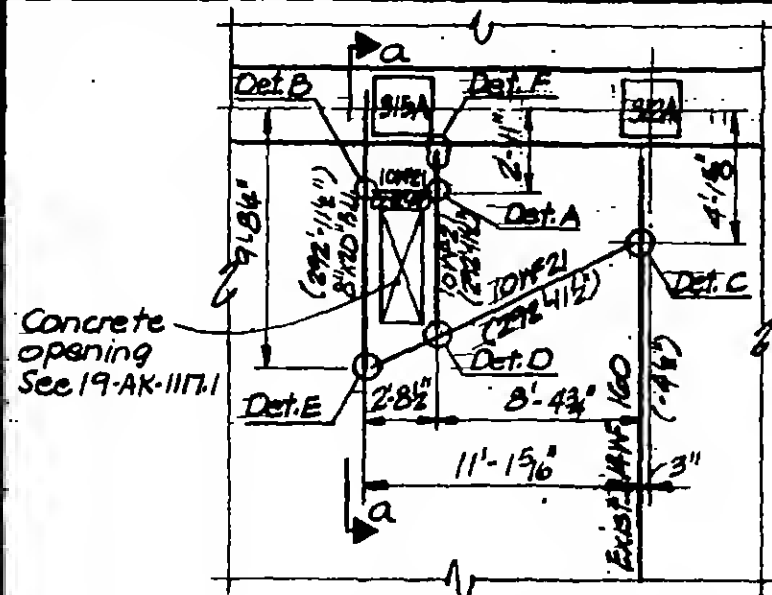
TITLE

NEW OPENINGS - PATH KE

DATE

12-21-72

REVISIONS

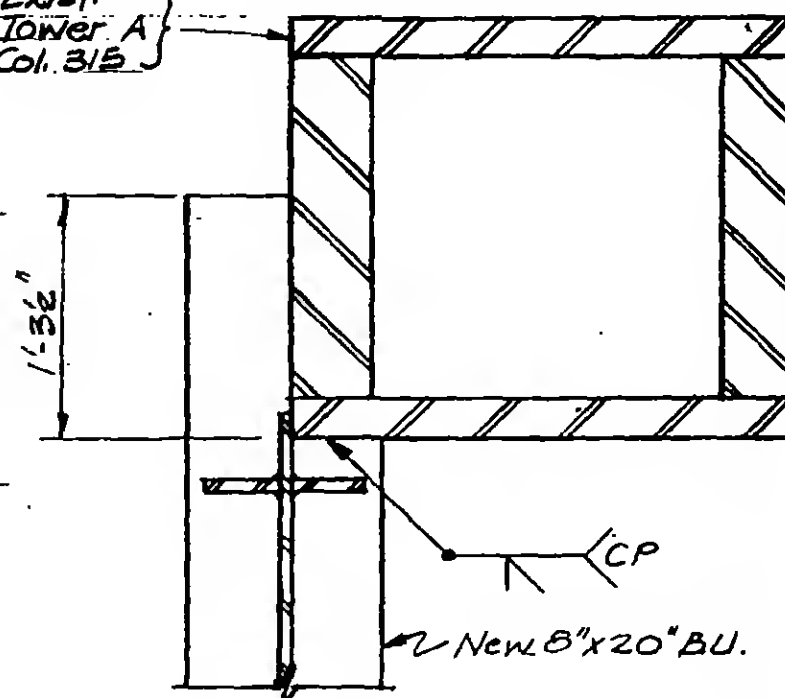


Part Plan - El. 294

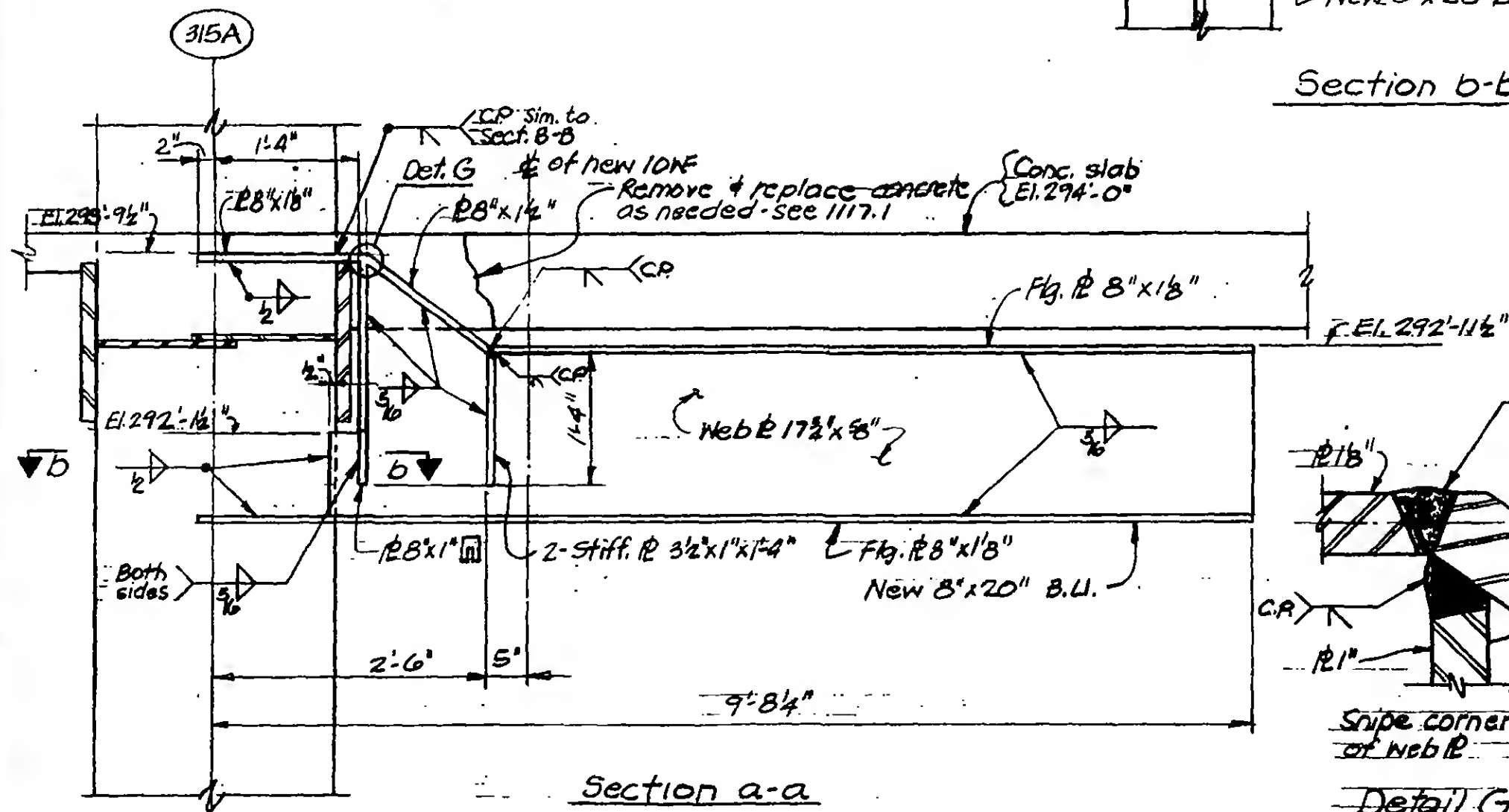


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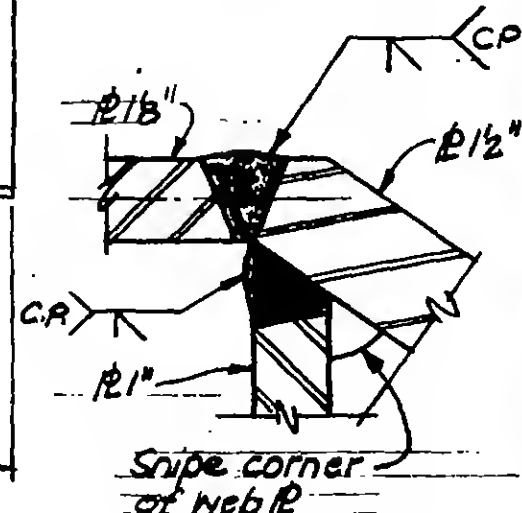
1. Use proper preheat before welding on exist. col. & spandrel beam.
2. All welding E7018 (low hydrogen).
3. All steel A56.
4. Verify all field dimensions before fabrication.

Exist.
Tower A
Col. 315

Section b-b



Section a-a



Detail G

19-AK-1117.2



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JTM

DRAWN

P. M. M. M.

REVIEWED

PROJECT

THE WORLD TRADE CENTER

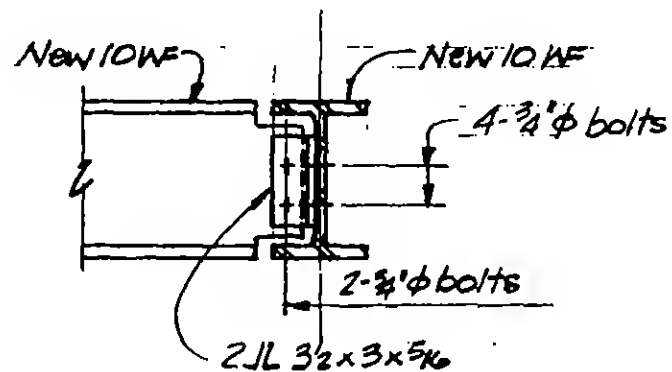
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NEW OPENINGS - PATH RE

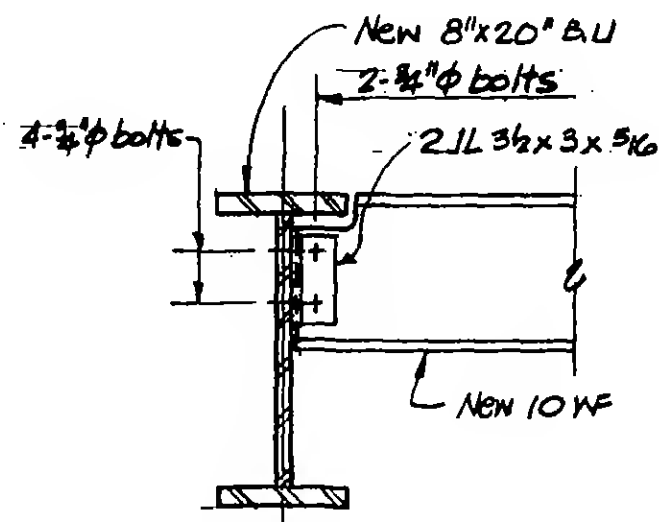
DATE

12-21-72

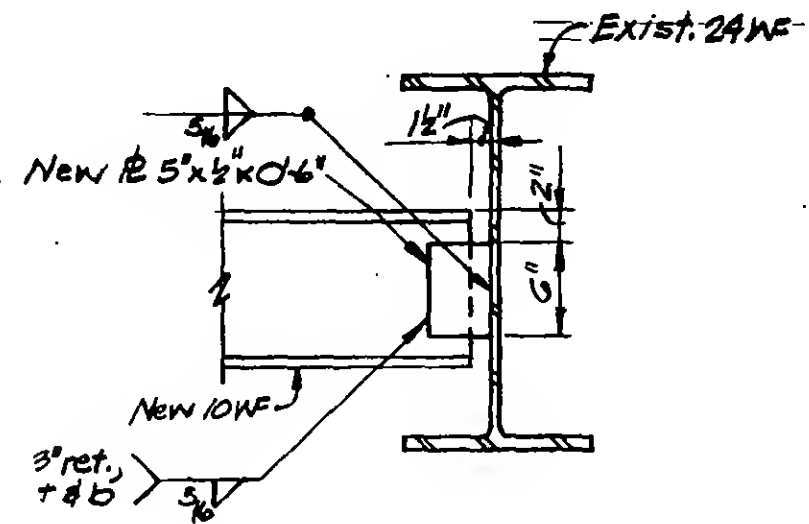
REVISIONS



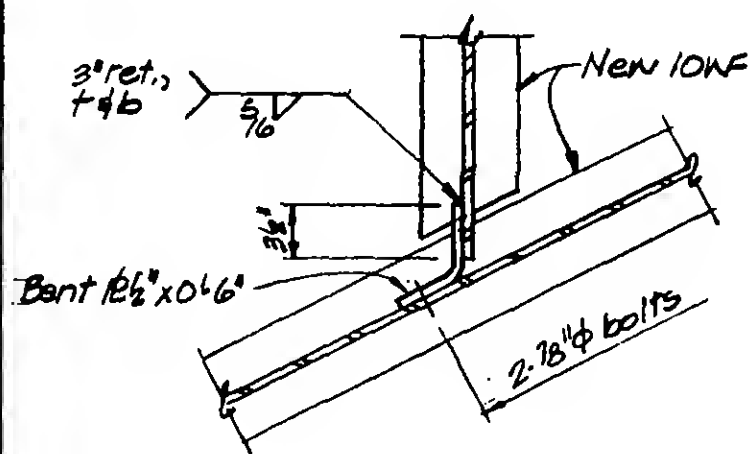
Detail A



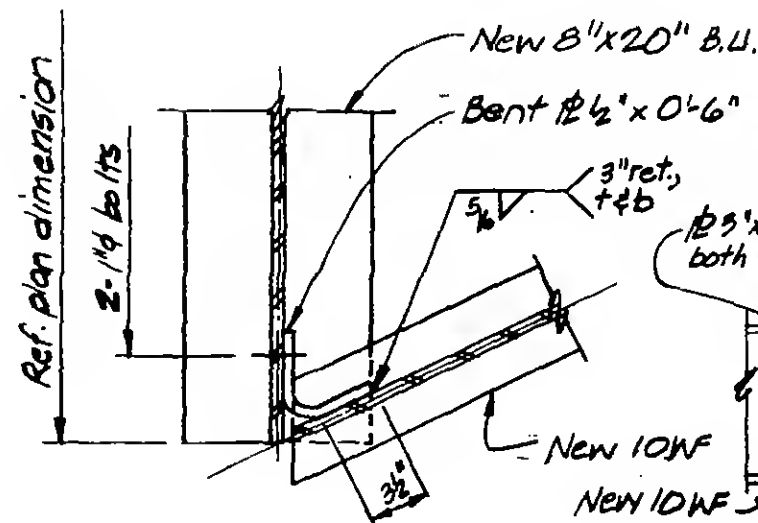
Detail B



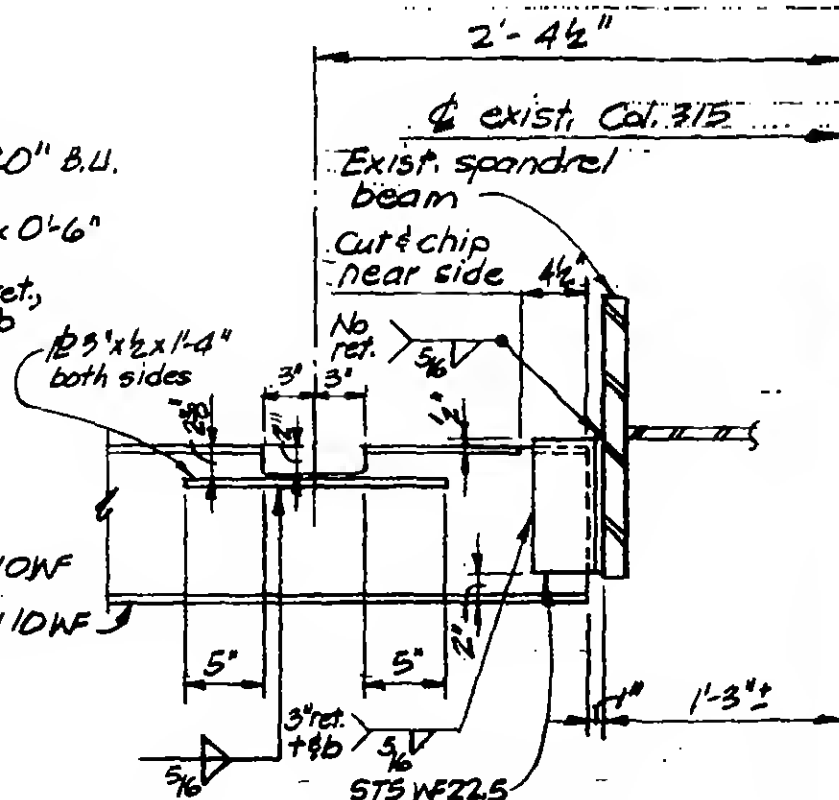
Detail C



Detail D



Detail E



Detail F



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JTM

DRAWN

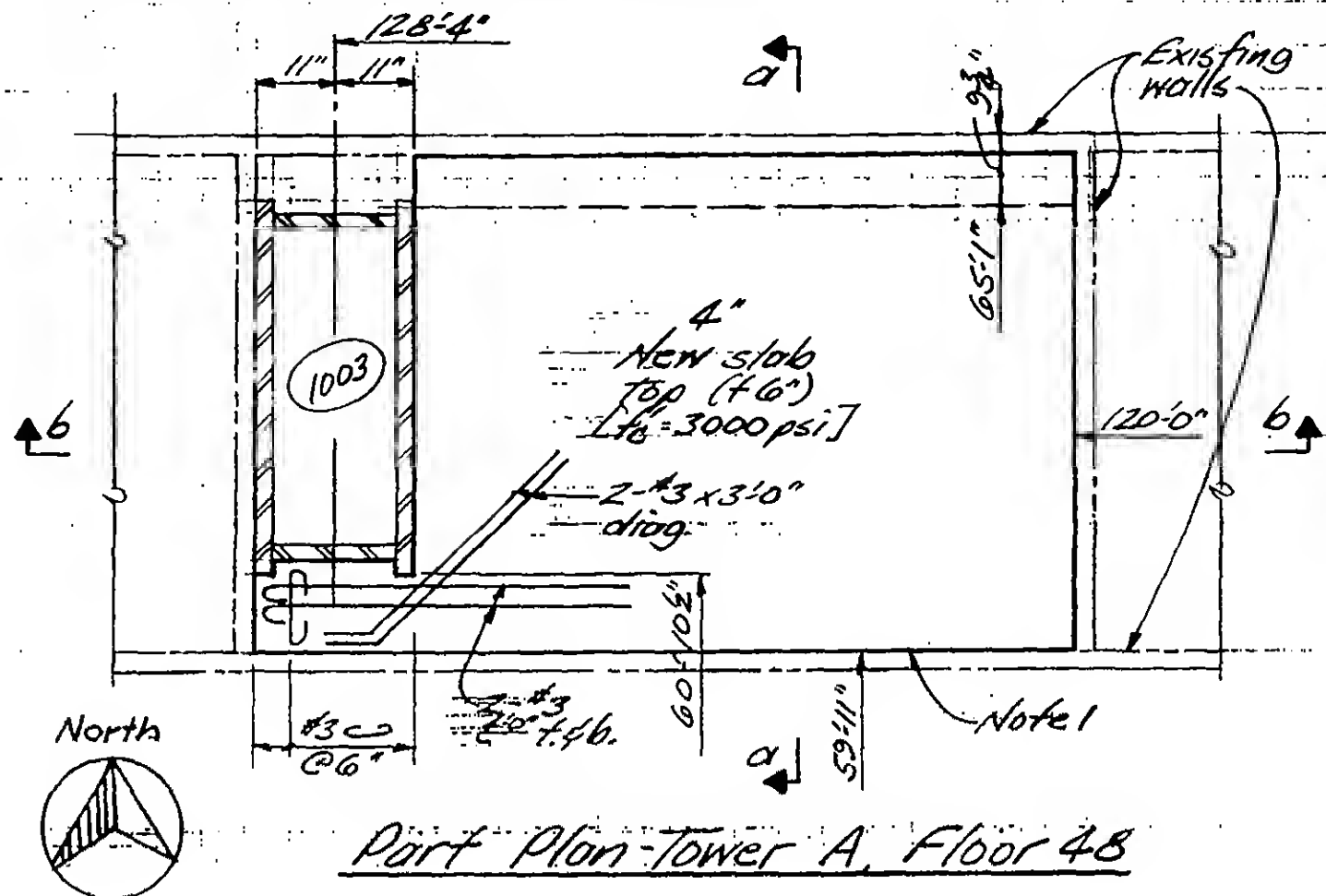
Phillips

REVIEWED

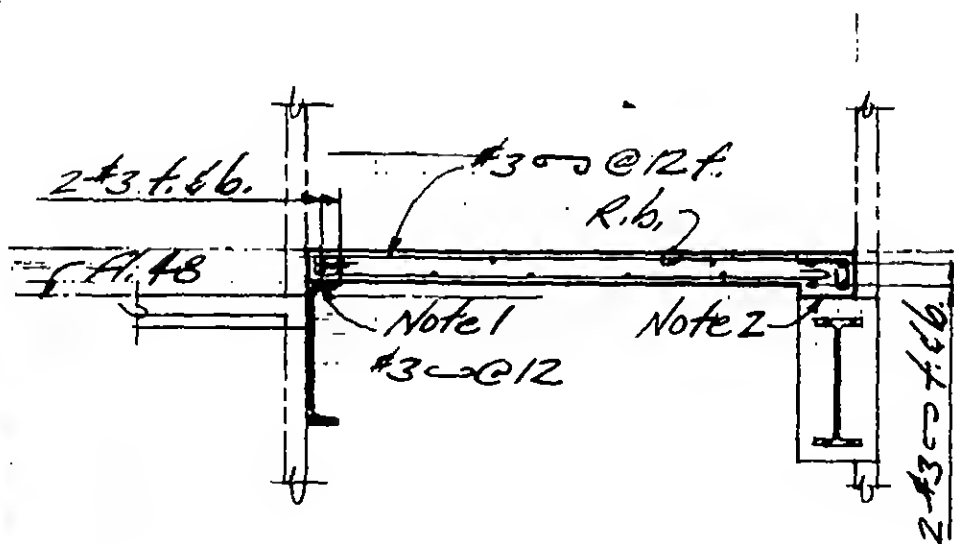
REVISIONS

Notes:

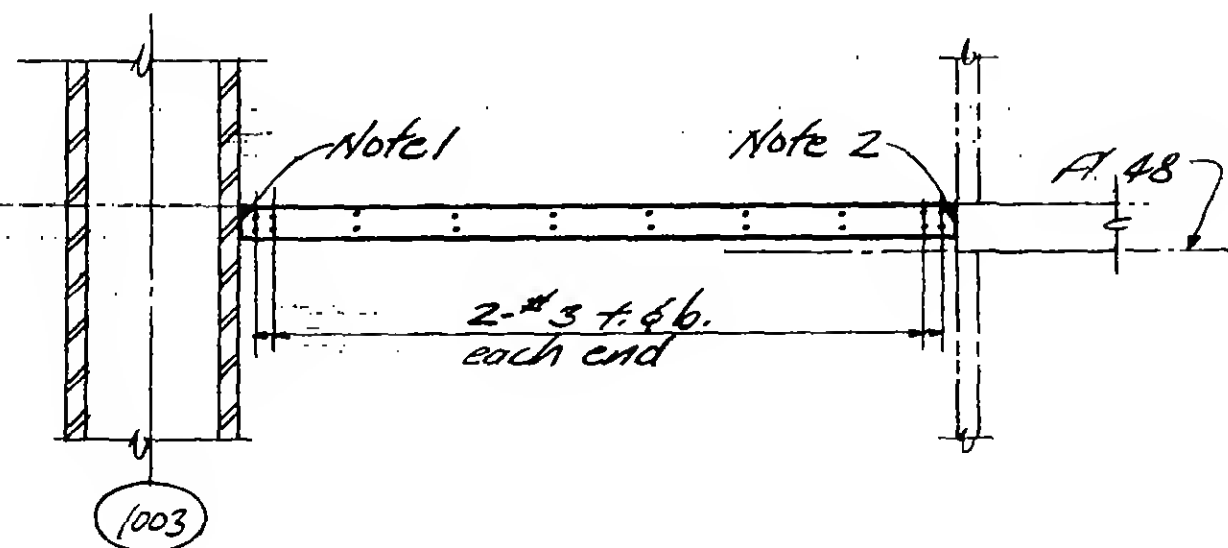
1. Remove existing wall and spray fireproofing as required to construct new slab.
2. Clean face of existing concrete and thoroughly coat entire surface with epoxy bonding compound.



Part Plan Tower A, Floor 48



Section a-a



Section b-b



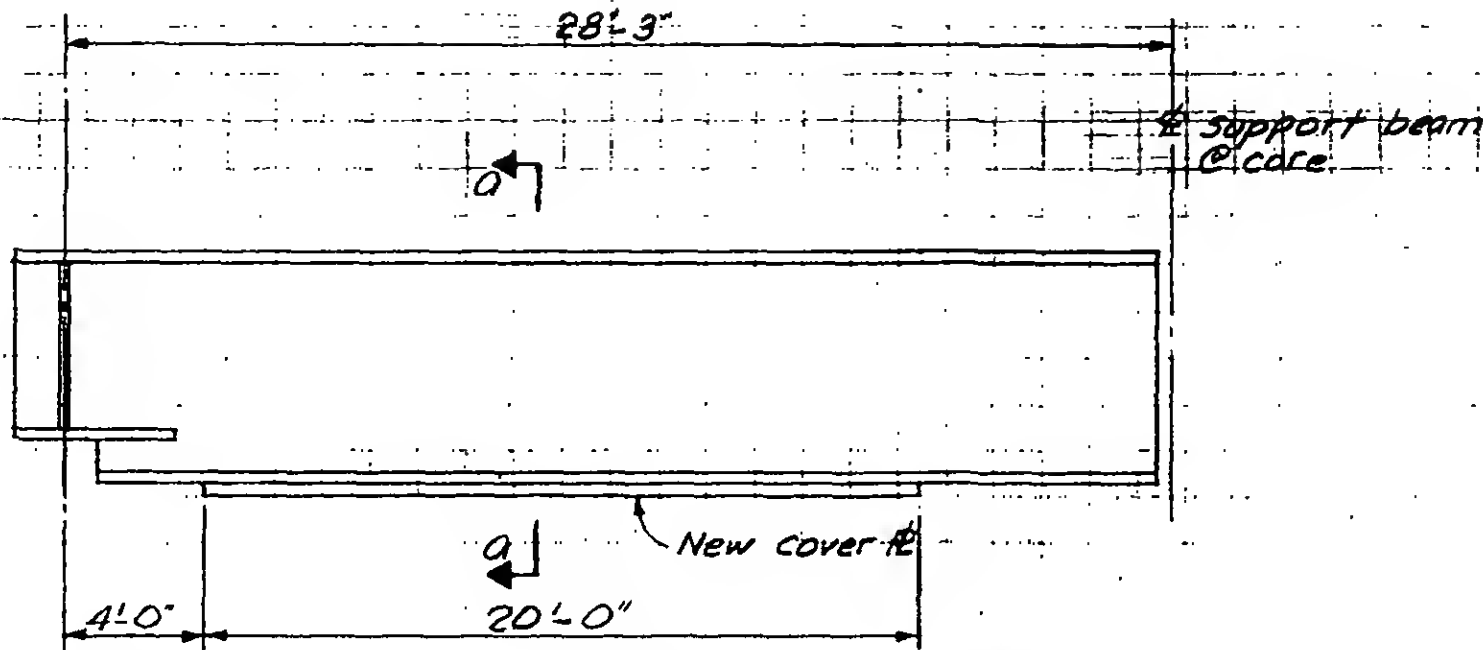
DESIGNED

DRAWN

REVIEWED

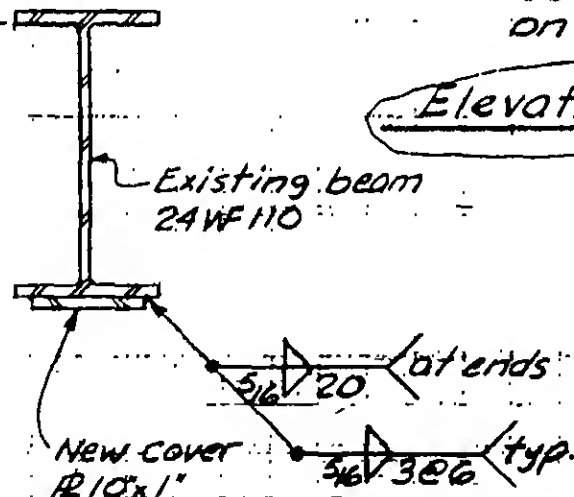
REVISIONS

7-17-72

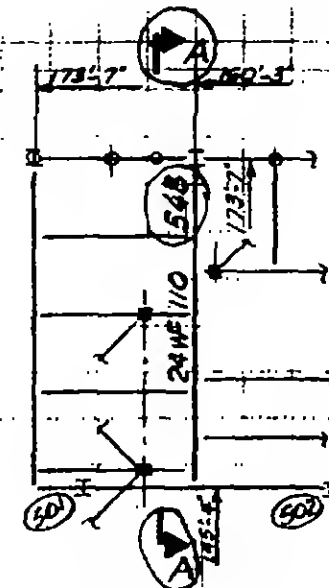


Beam No. 503 & 548 as marked on Shop Drawing.

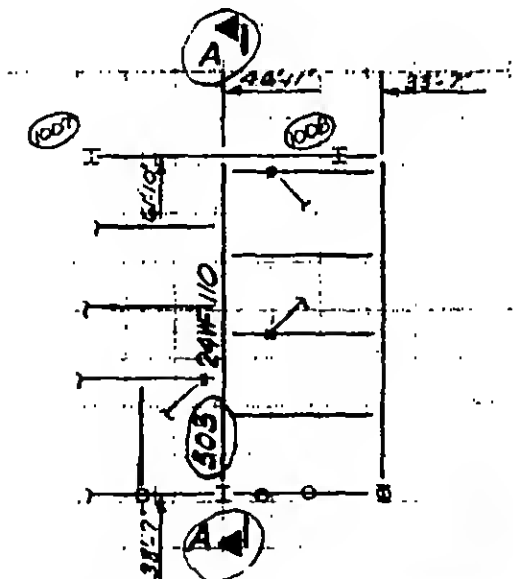
Elevation A-A



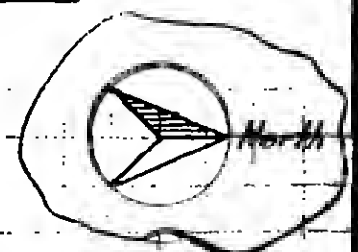
Section A-A



Part Plan



Part Plan



DESIGNED M. RAMANI

DRAWN A. FRANQUI

REVIEWED [Signature]

PROJECT

THE WORLD TRADE CENTER

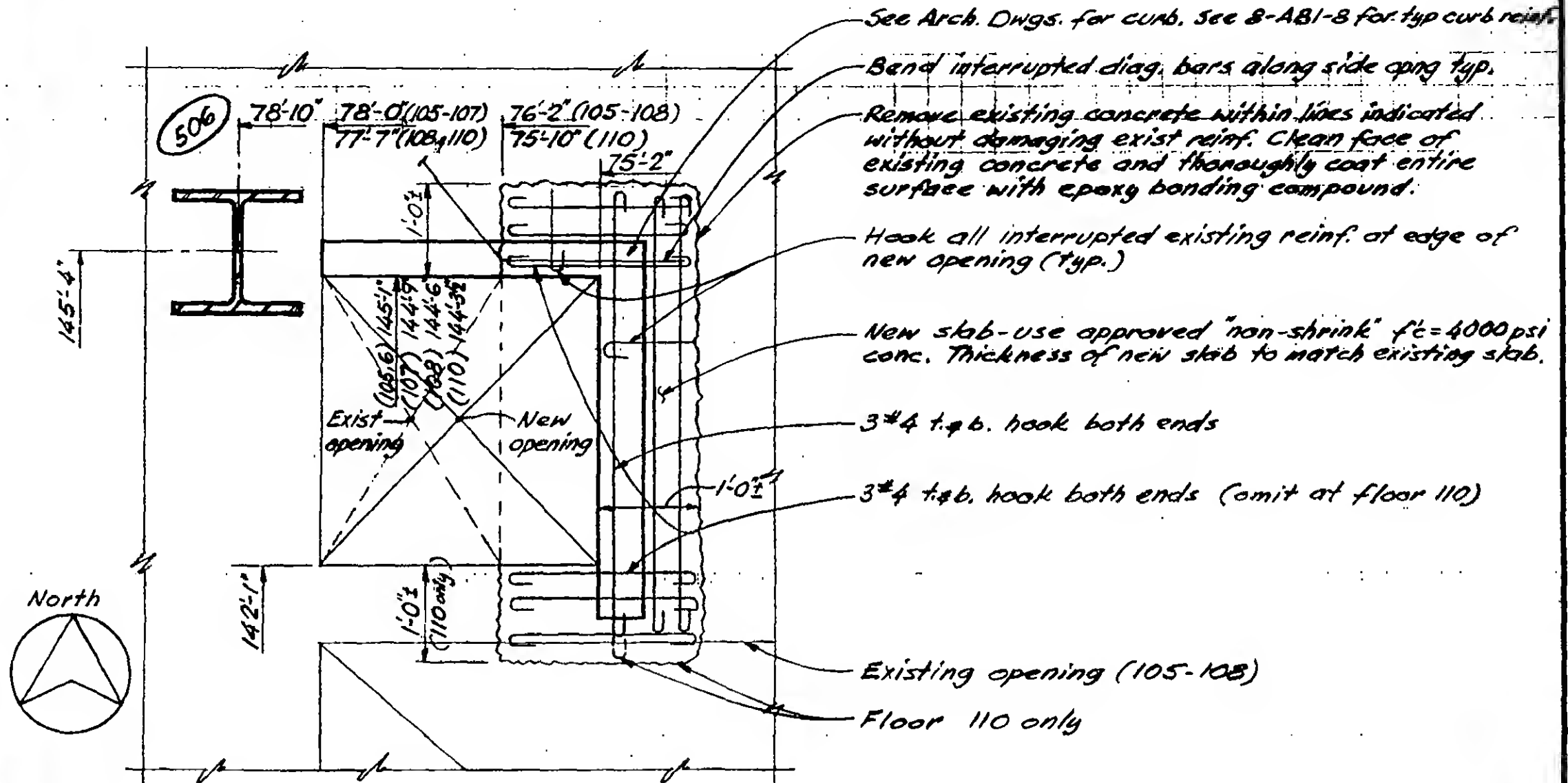
TITLE

ENLARGED OPENING AT TV TRANSMISSION LINE SHAFT - TOWER A

DATE

5-15-72

REVISIONS



Part Plan at Floor 105, 106, 107, 108 & 110



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JTM

DRAWN

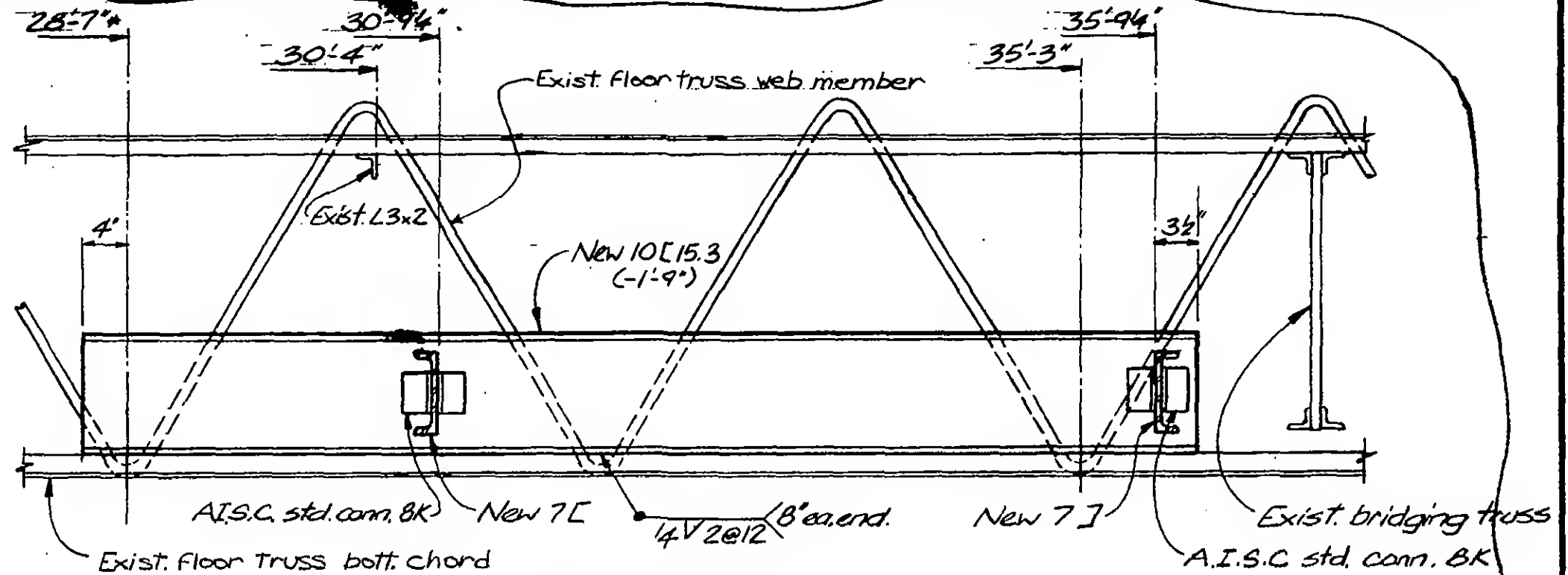
JG

REVIEWED

19-A-1120

REVISIONS

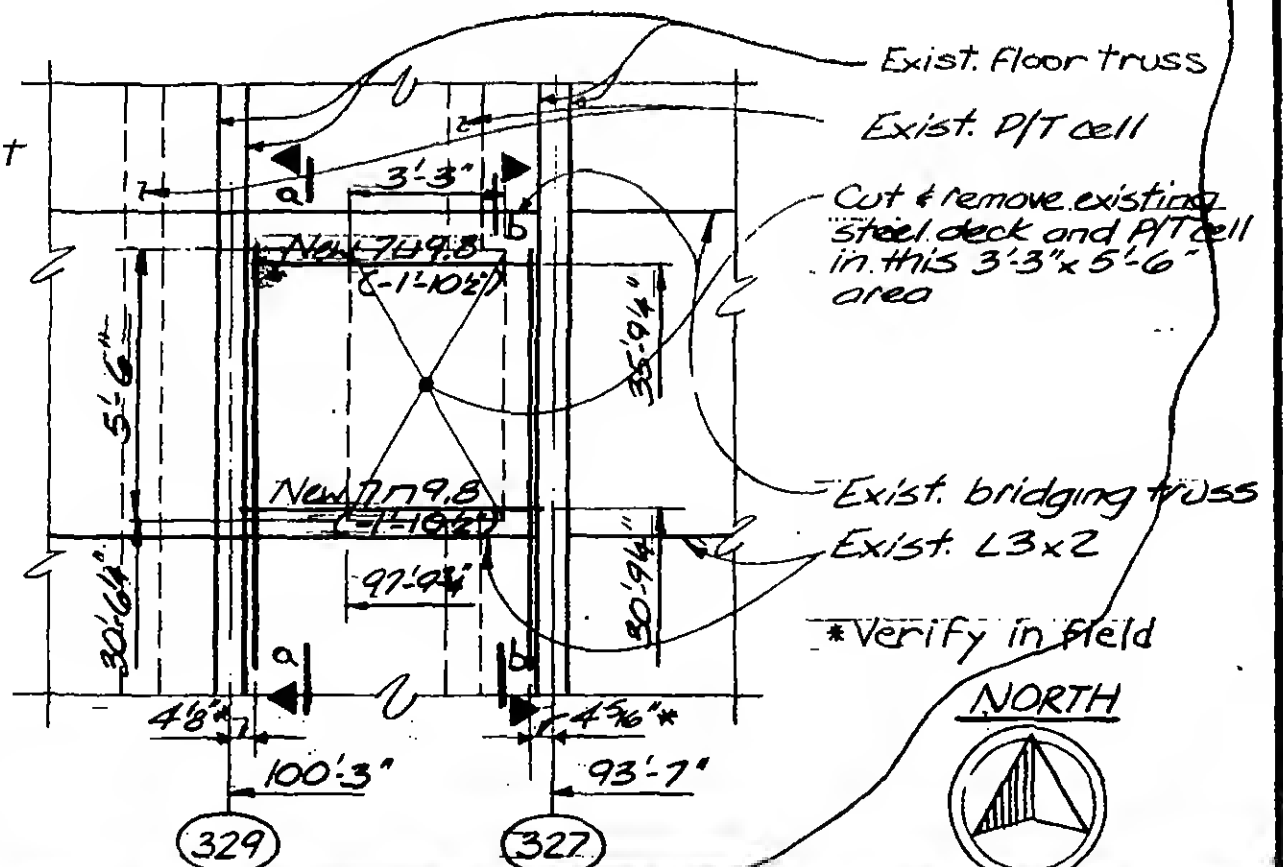
6-26-74



Section a-a

Section b-b (opp. hand.)

- Notes: (1) Elevation of top new L's given (-) below ref. Fl. 106.
 (2) New 10C15.3's hard against web member of exist. floor truss



Part Plan Fl. 106

19-A-1122



DESIGNED

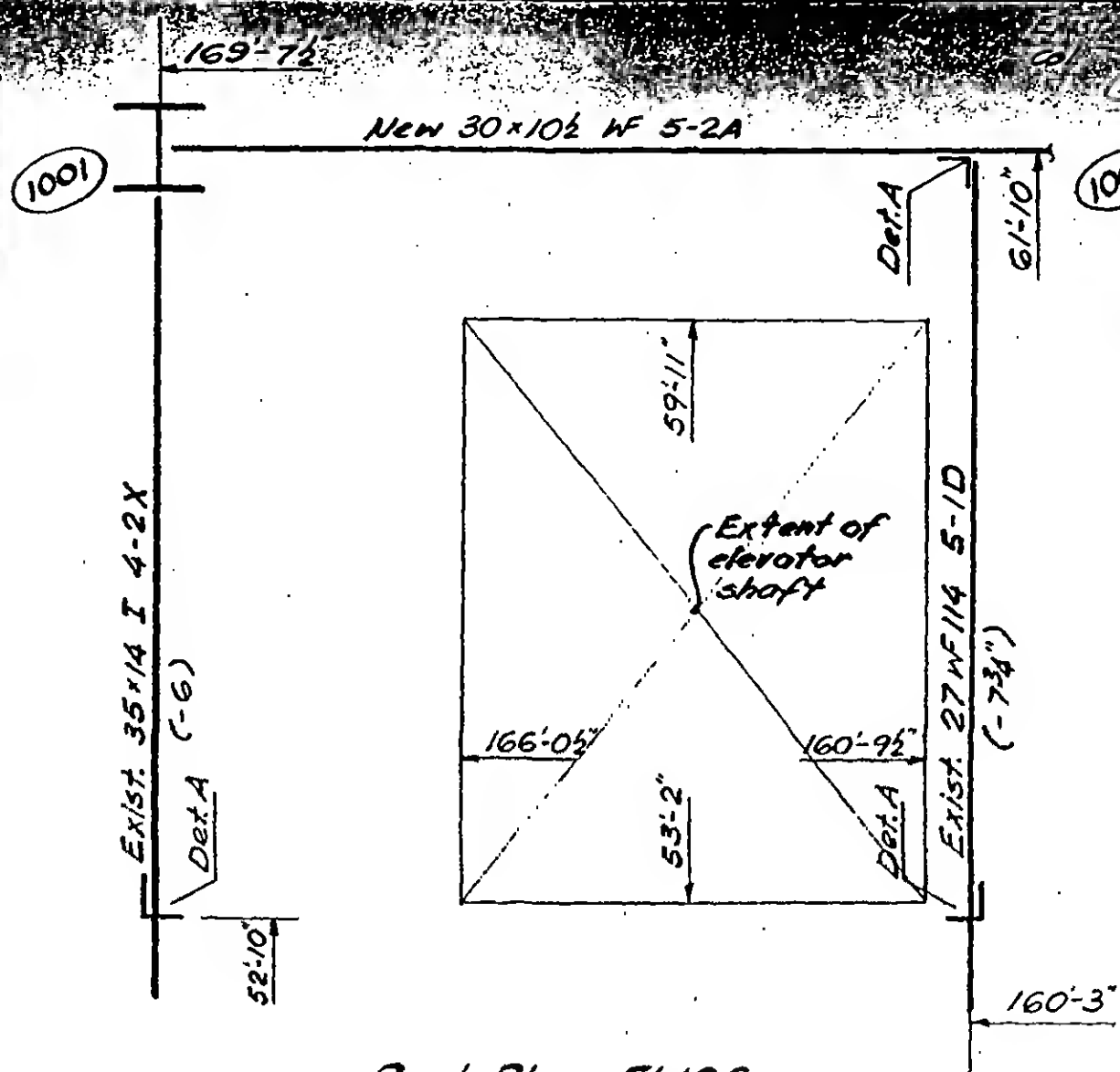
J.T.M.

DRAWN

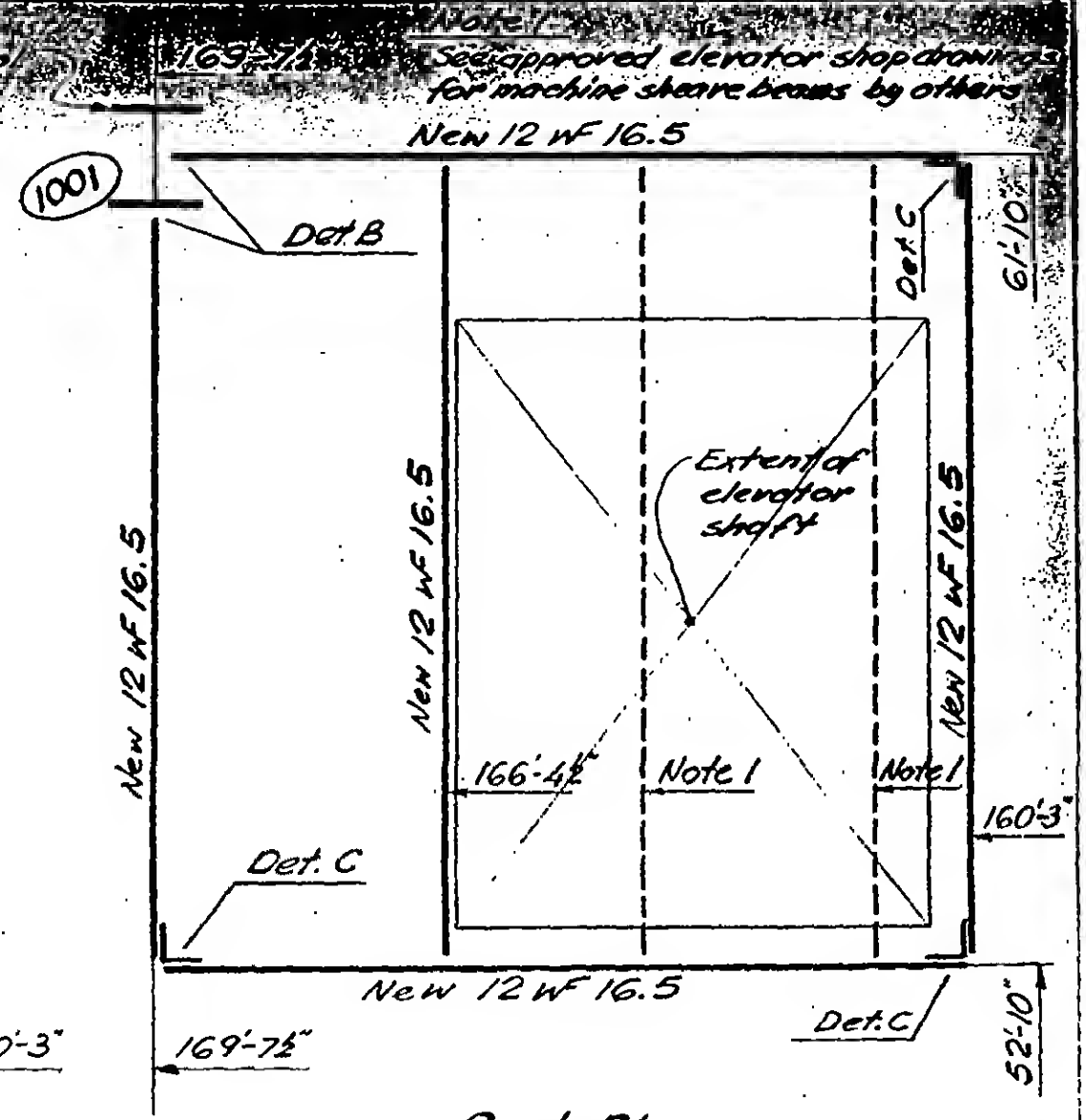
Brown

REVIEWED

WAB

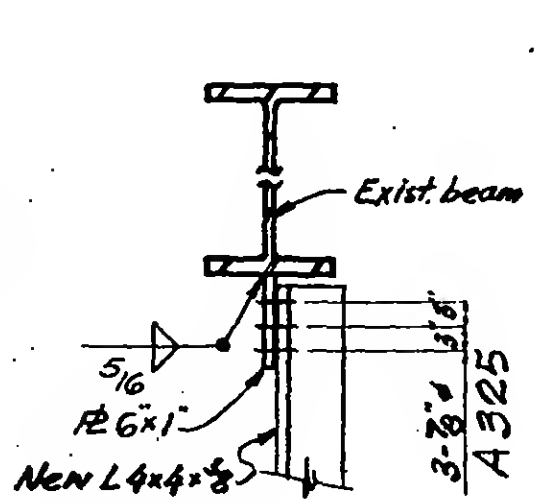


Part Plan-FI.108

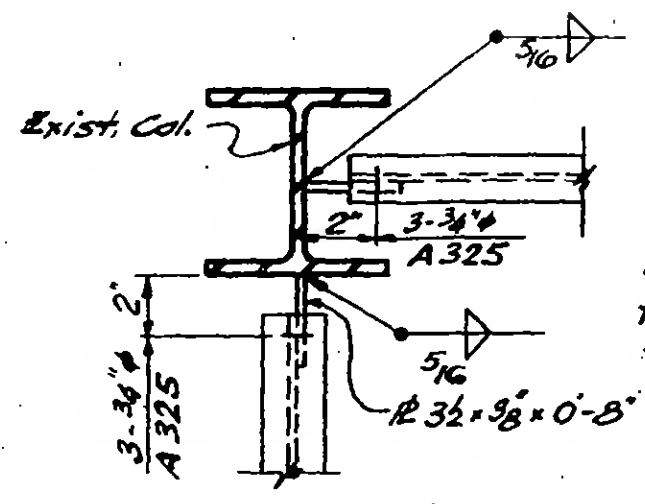


Part Plan

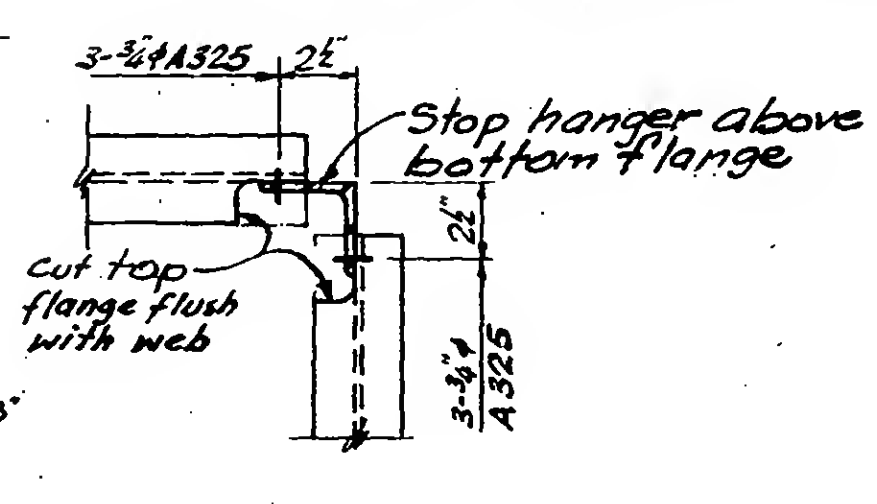
(T.O.B. +14'-6" above Fl. 107, unless noted)



Detail A
(Shown in elevation)



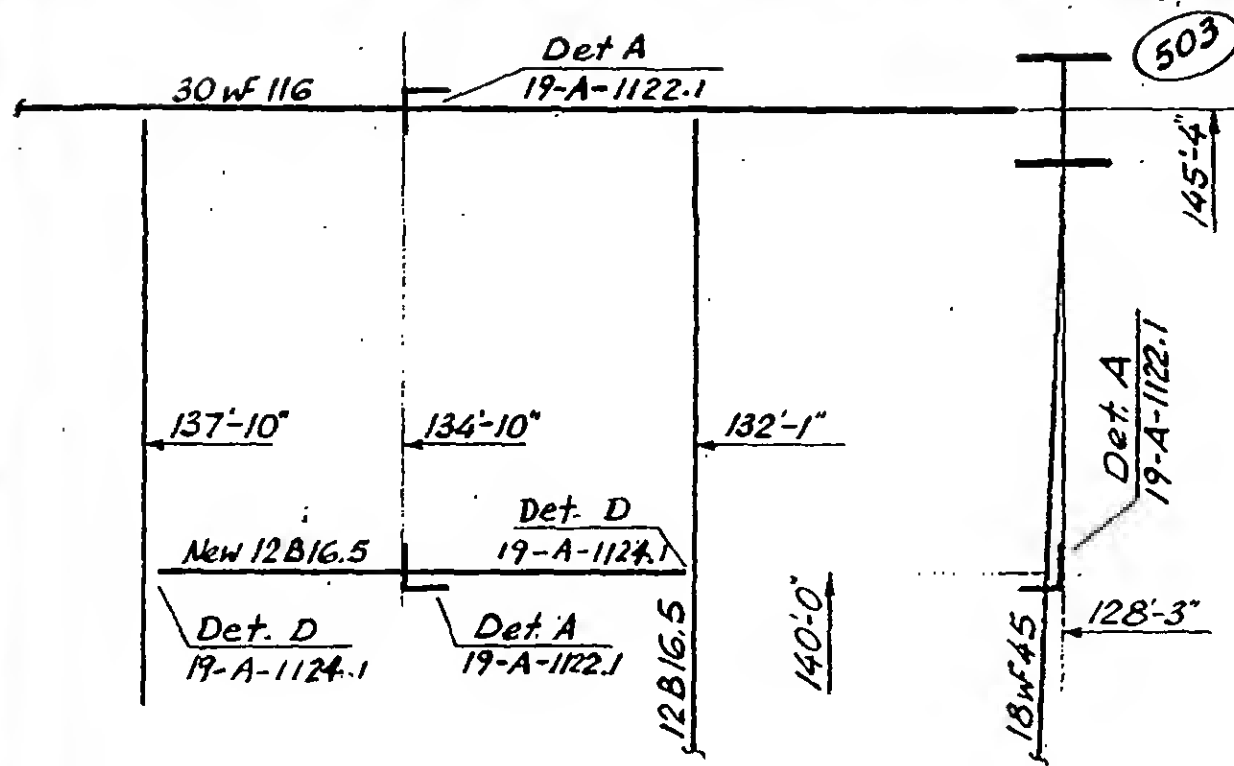
Detail B
(Shown in Plan)



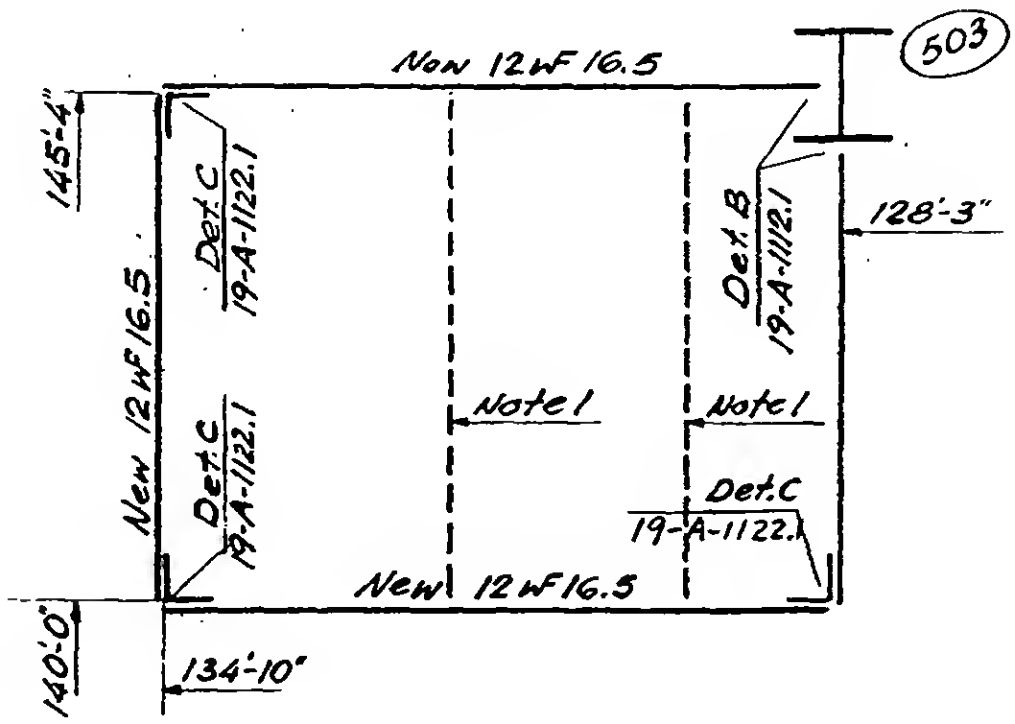
Detail C
(Shown in Plan)



DESIGNED
Chiang
DRAWN
J.G.



Port Plan Floor 108



Note 1.
See approved elevator shop drawing for machine sheave beams, by others.

Port Plan
(+12'-0" above Fl. 107)

19-A-1122.2

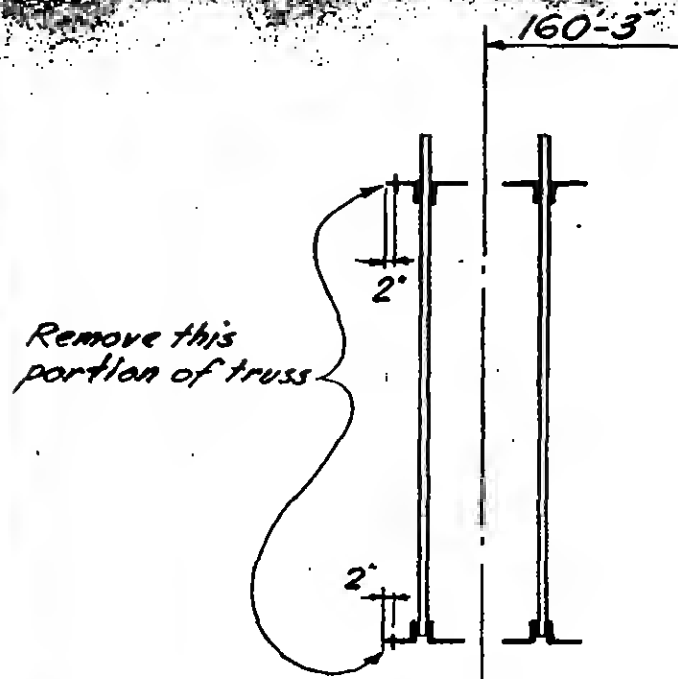


DESIGNED
K. Chiang

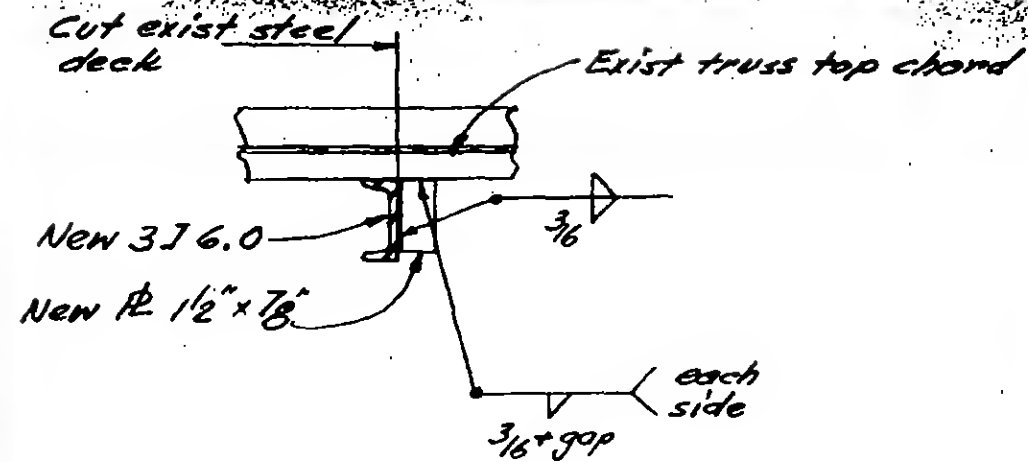
DRAWN
JG

REVIEWED

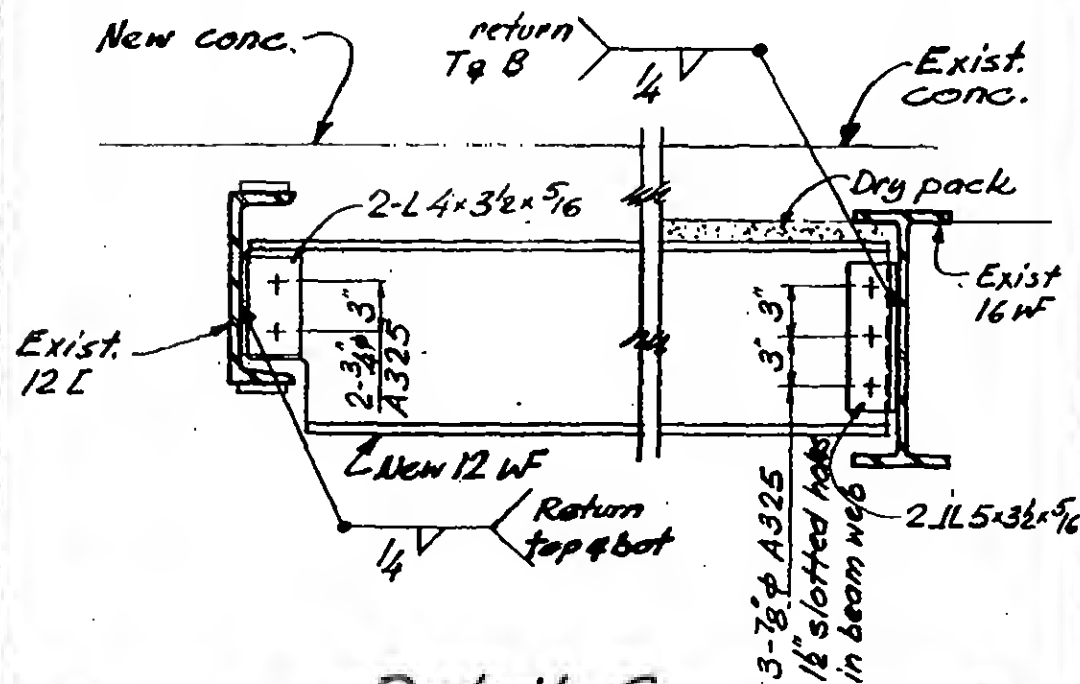
REVISIONS



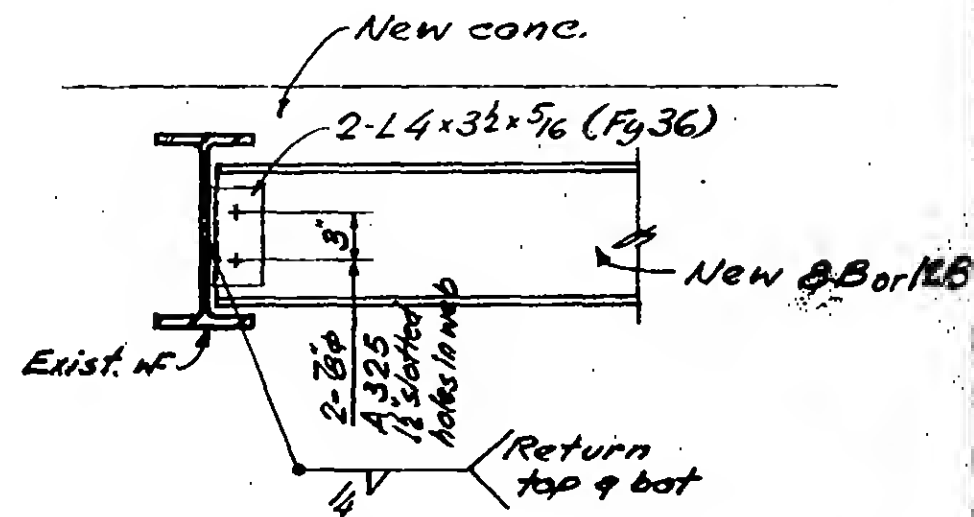
Detail A
(Truss elevation looking North)



Detail B



Detail C



Detail D



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Chiang

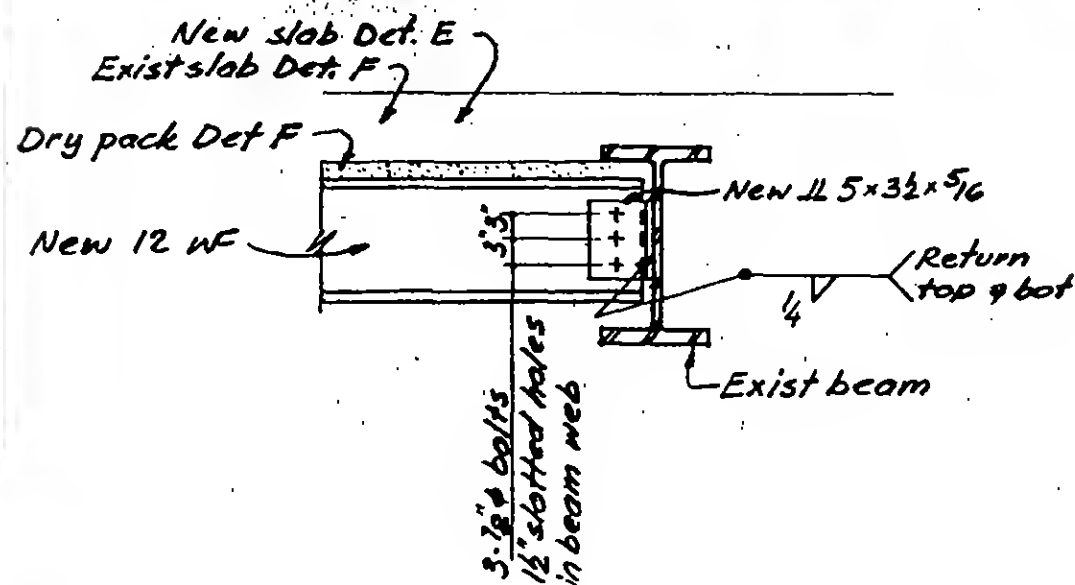
DRAWN

JG

REVIEWED

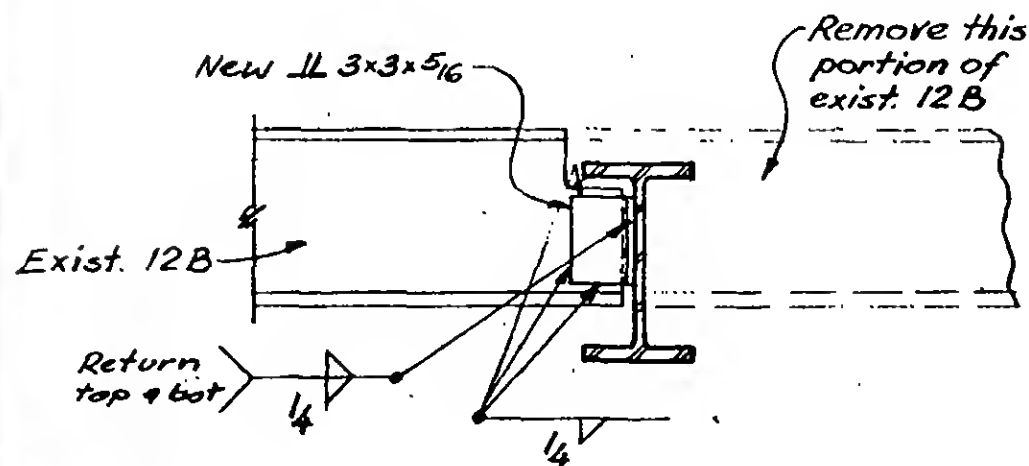
19-A-1124.1

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Detail E

Detail F



Detail G

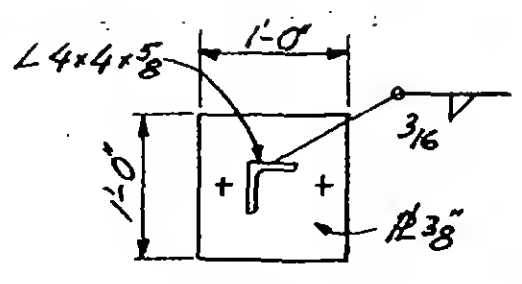


DESIGNED

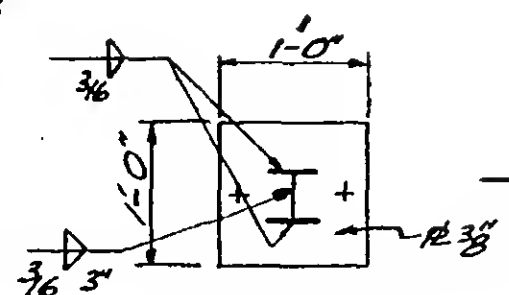
DRAWN

REVIEWED

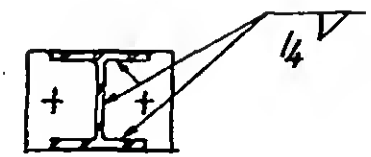
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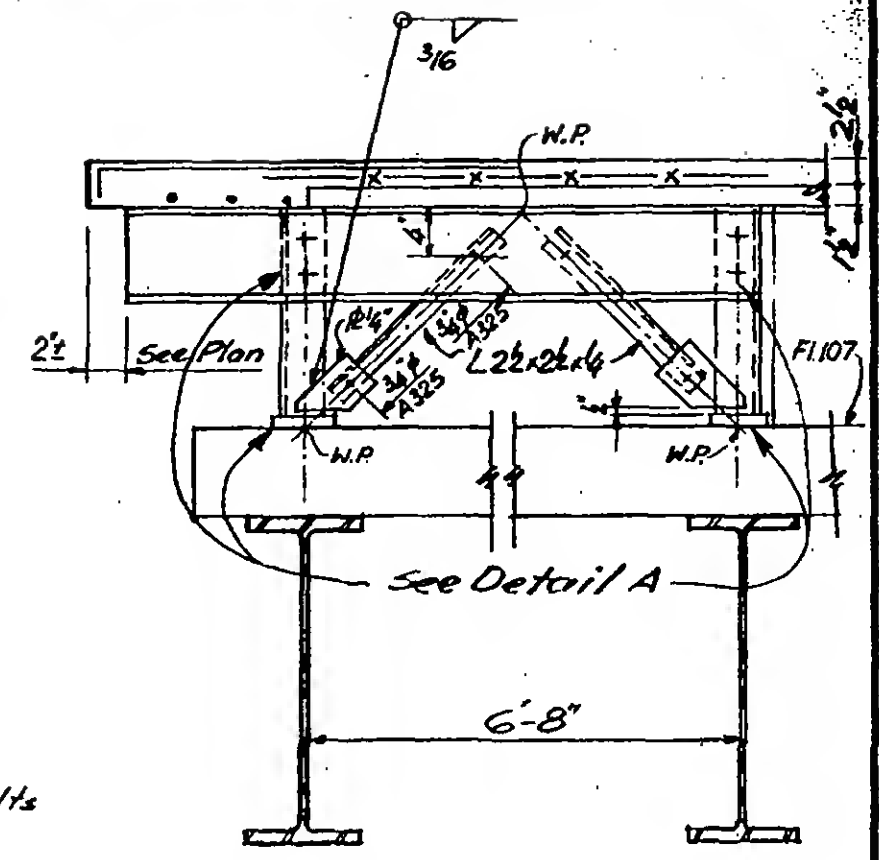
Section a-a



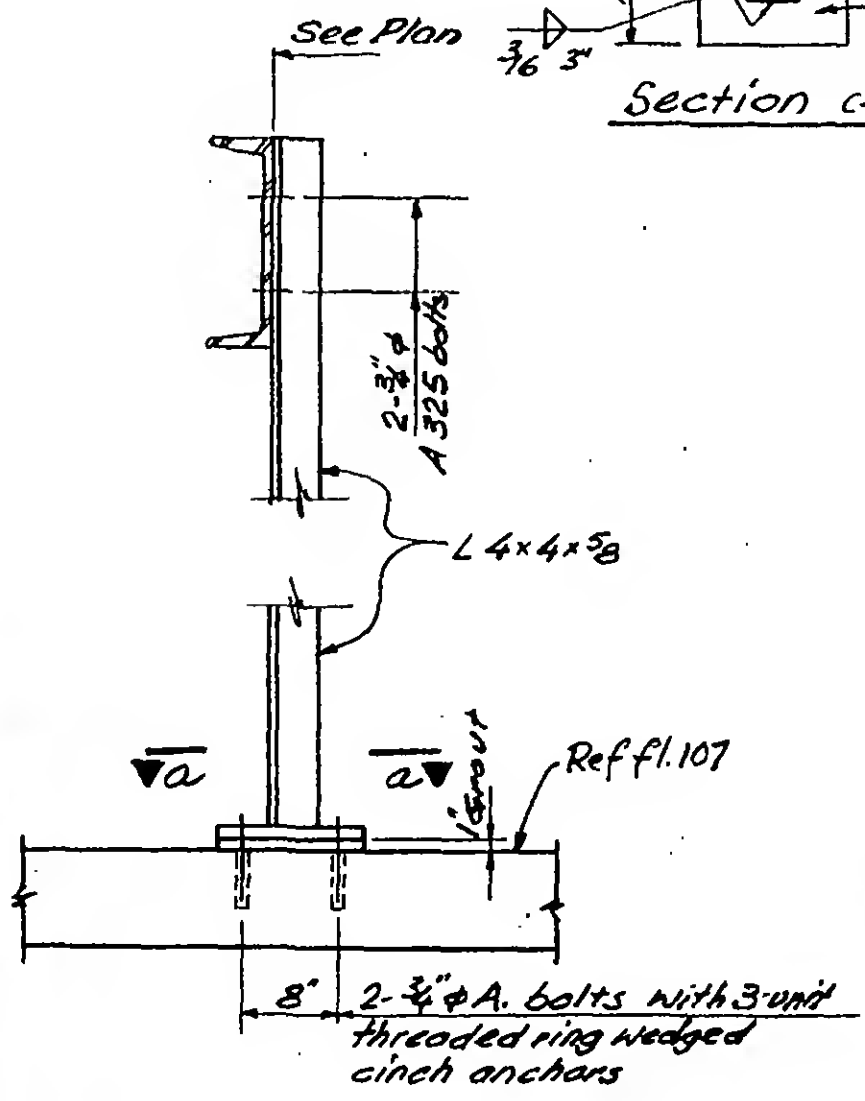
Section c-c



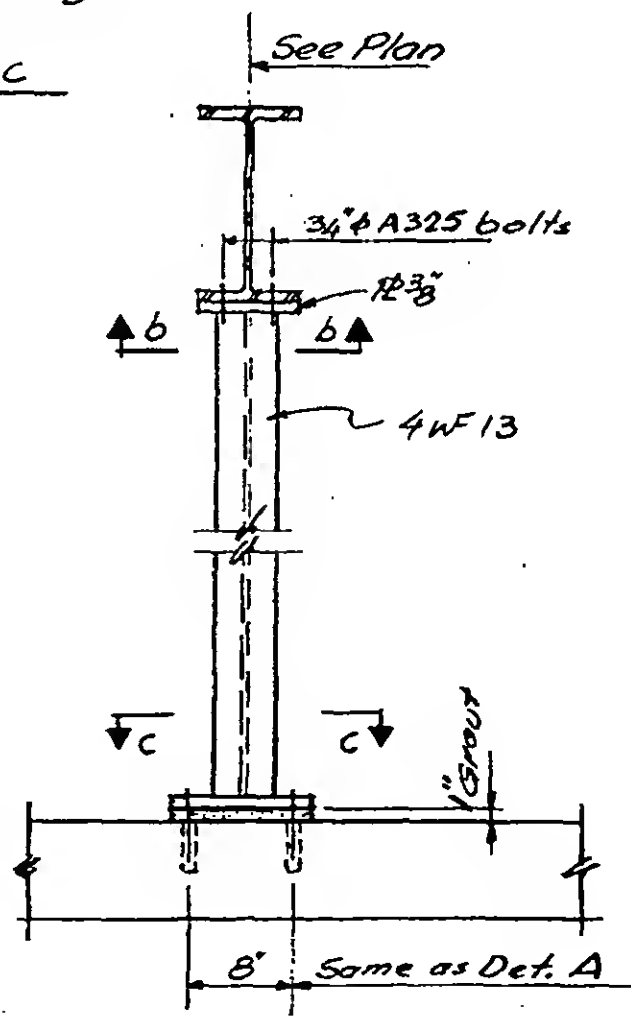
Section b-b



Section c-c



Detail A

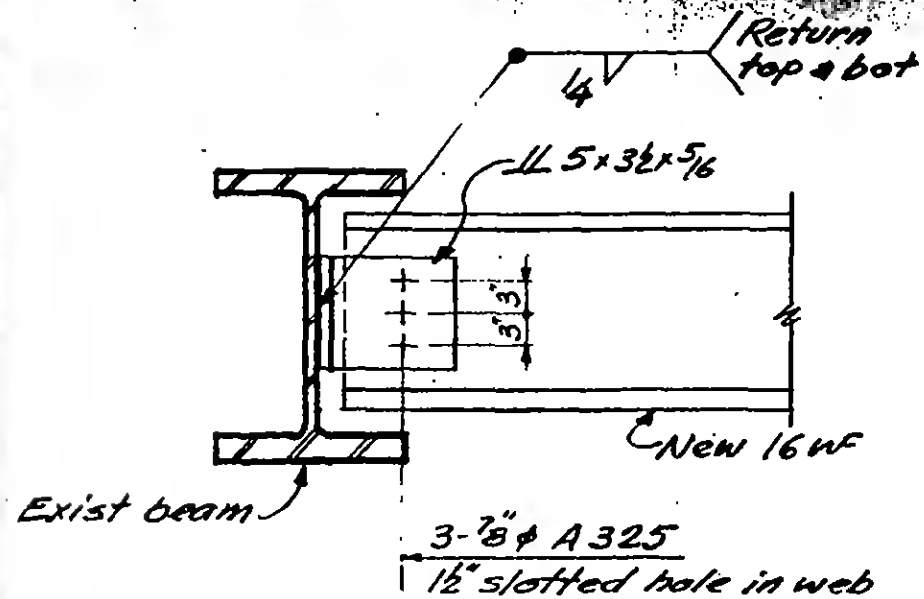


Detail B



DESIGNED
 LESLIE E. ROBERTSON
 NO. 34360
 STATE OF NEW YORK
 DRAWN
 J.G.
 REVIEWED

REVISIONS



Detail D



DESIGNED

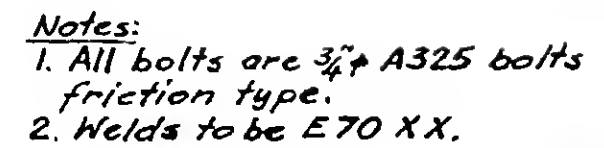
K. Chiong

DRAWN

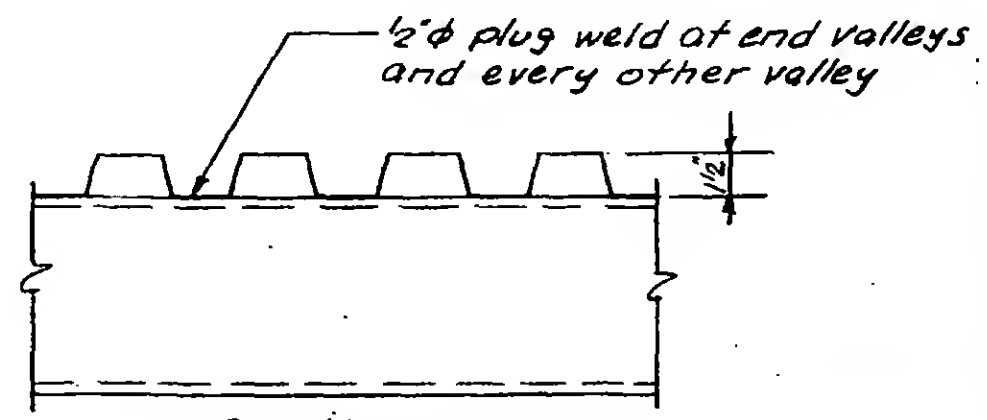
JG

REVIEWED

19-A-1125.2



Detail Elevation



Section a-a

Steel deck supported on steel Beams

19-A-1127



K. Chiang

DRAWN

REVIEW CO

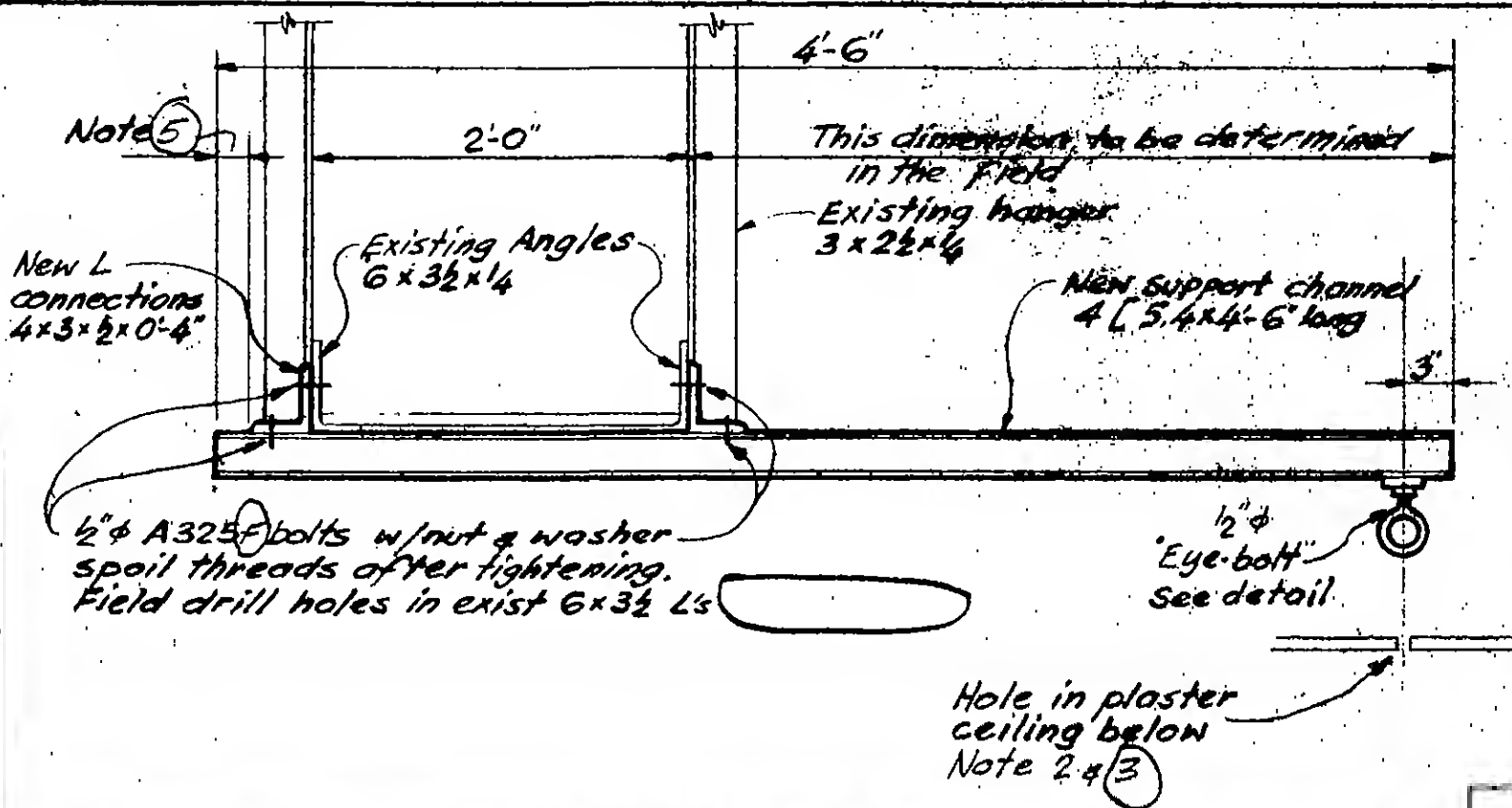
PROJECT THE WORLD TRADE CENTER

TITLE TOWER A & B LOBBY CEILING WASHER SUPPORTS CORE

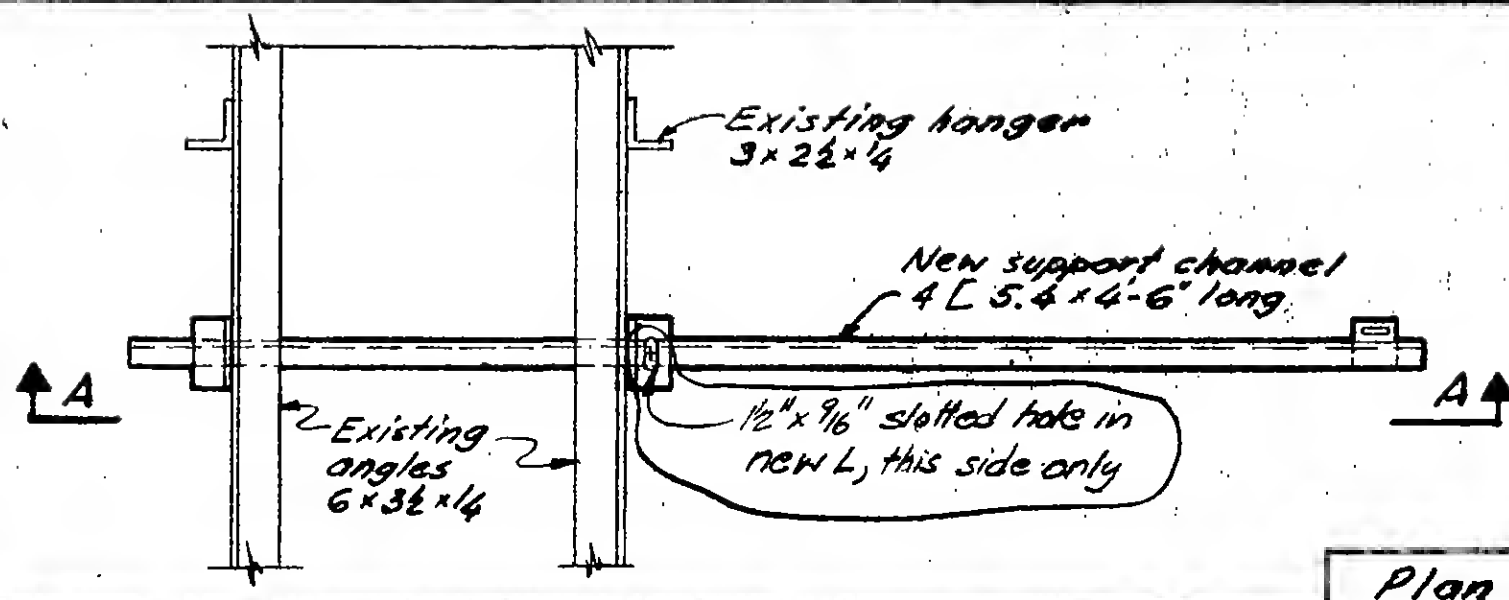
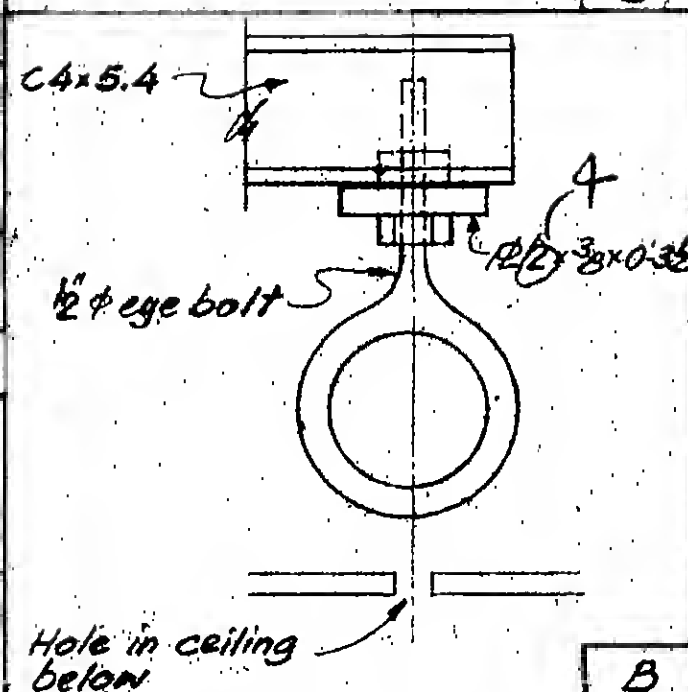
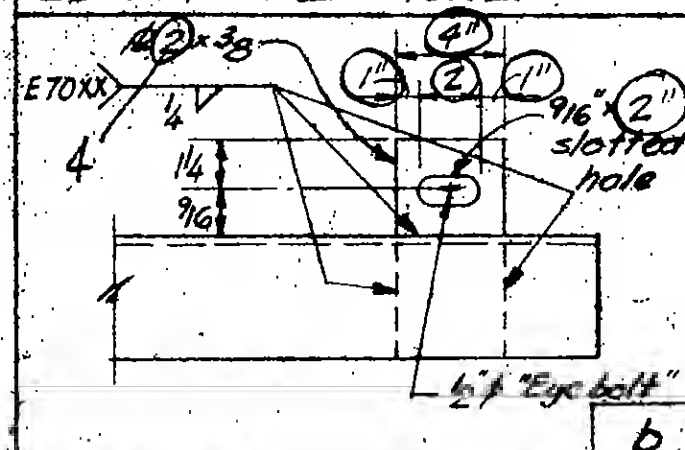
DATE 7-9-73

REVISIONS

1-8-74



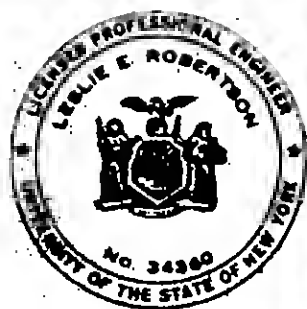
26 REQ'D PER TOWER



1. Erect assembly, all bolts finger tight.
2. Position, in field, eye bolt over existing holes in plaster ceiling.
3. Drop string-line (i.e. "plumb-bob") through hole in plaster ceiling. Check to see that string-line is not binding or rubbing on plaster ceiling at hole while adjusting all slotted hole connections.
4. Tighten all bolts.
5. Trim back-side of channel if necessary.

(Field) Procedure

19-AB-1128.1



DESIGNED

A.R.

DRAWN

J.G.

REVIEWED

WAB

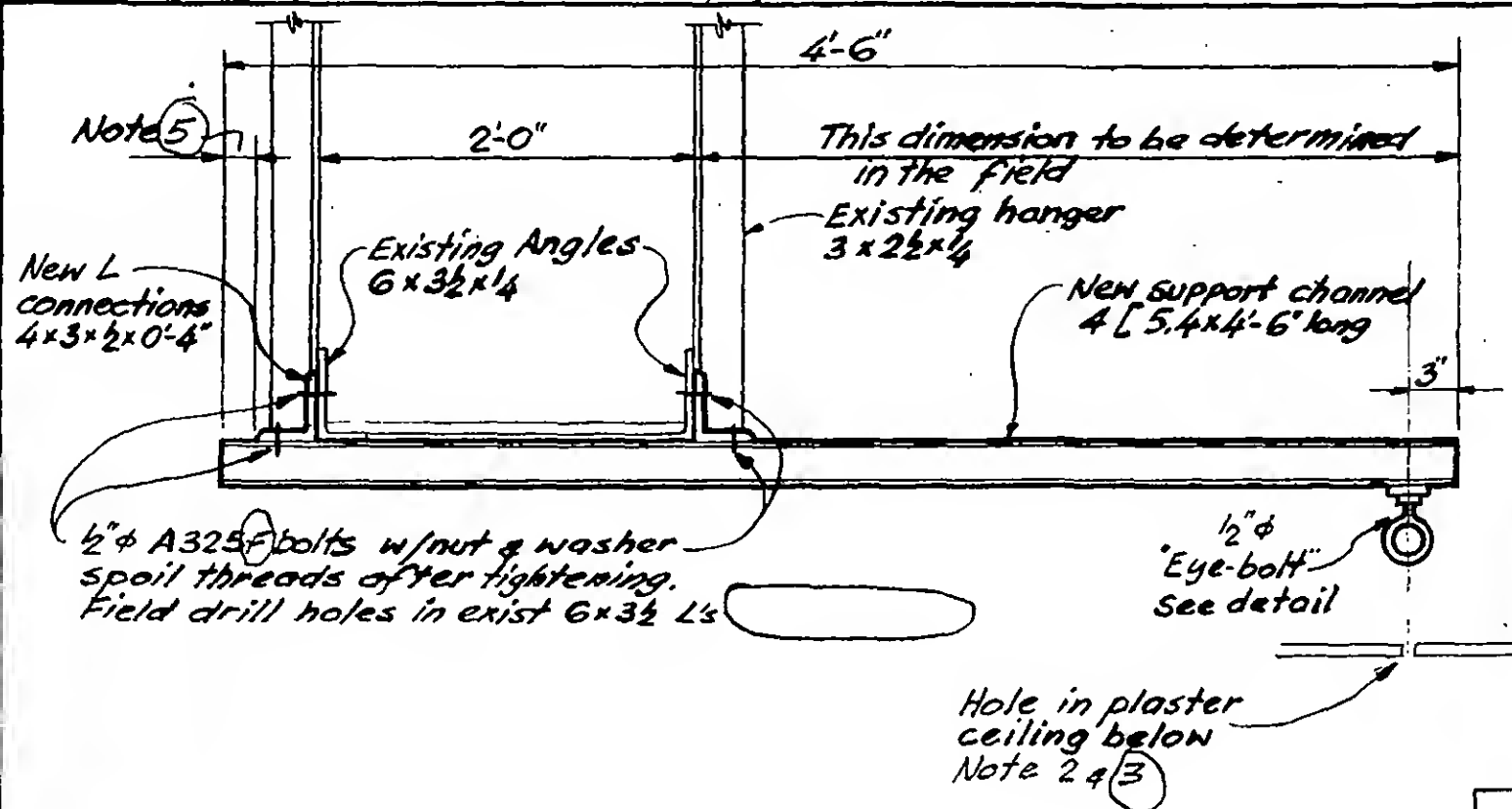
PROJECT THE WORLD TRADE CENTER

TITLE TOWER A & B - LOBBY CEILING WASHER SUPPORTS CORE

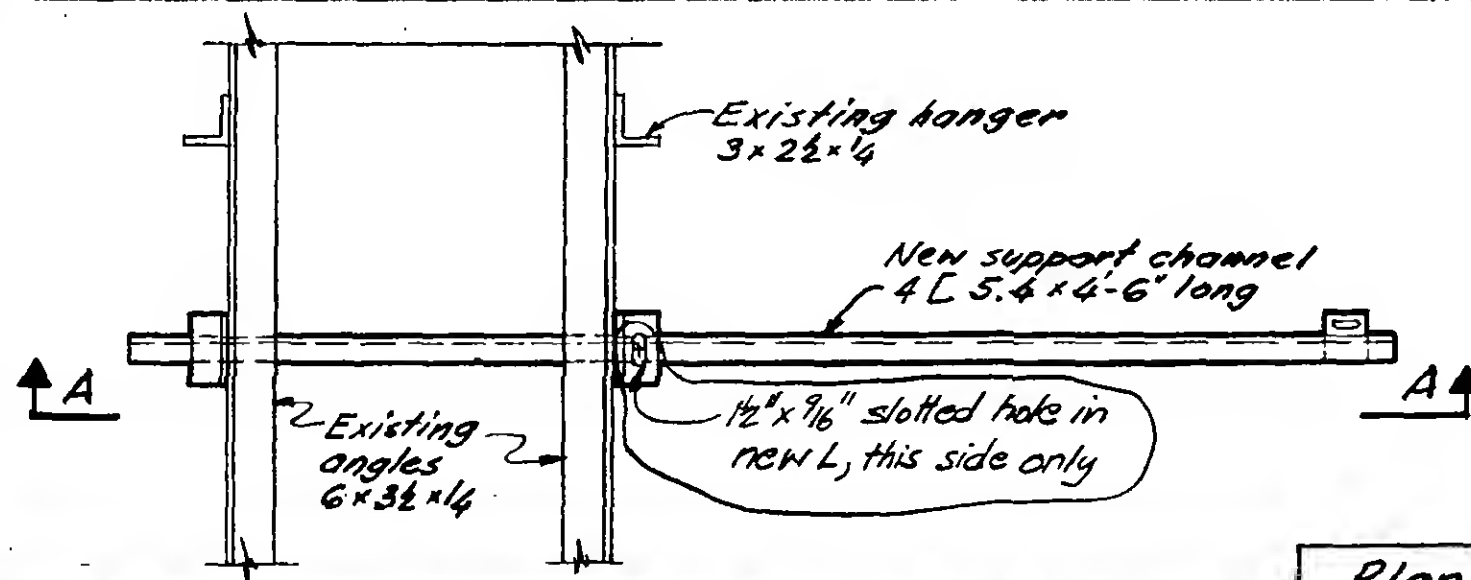
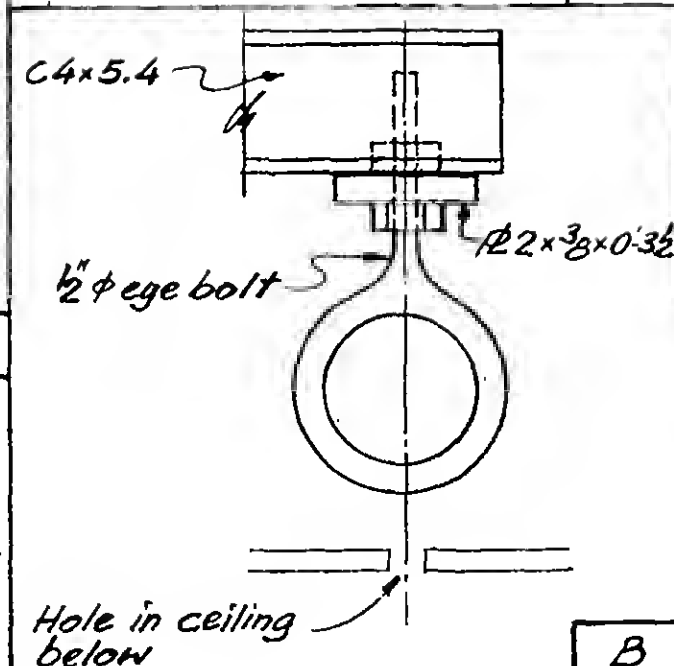
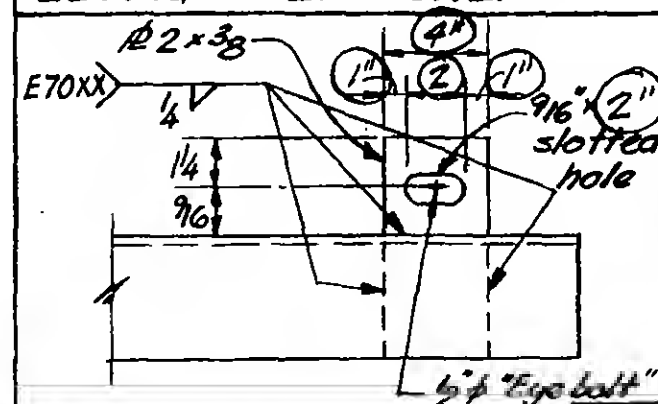
DATE 7-9-73

REVISIONS

1-8-74



26 REQ'D PER TOWER



Plan

1. Erect assembly, all bolts finger tight.
2. Position, in field, eye bolt over existing holes in plaster ceiling.
3. Drop string-line (i.e. "plumb-bob") through hole in plaster ceiling. Check to see that string-line is not binding or rubbing on plaster ceiling at hole while adjusting all slotted hole connections.
4. Tighten all bolts.
5. Trim back-side of channel, if necessary.

Field Procedure

19-AB-1128.1



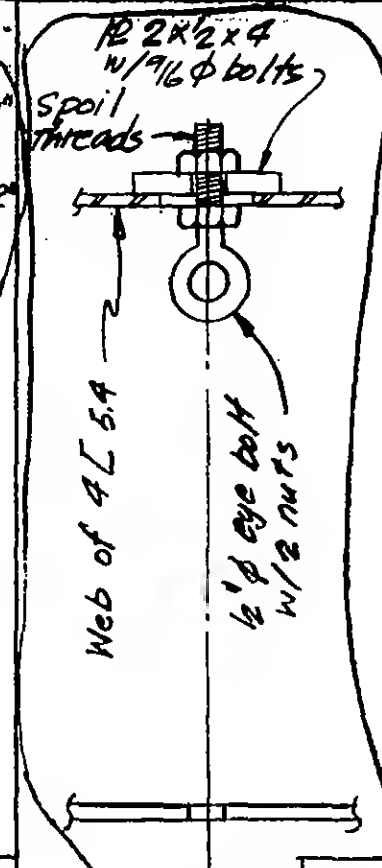
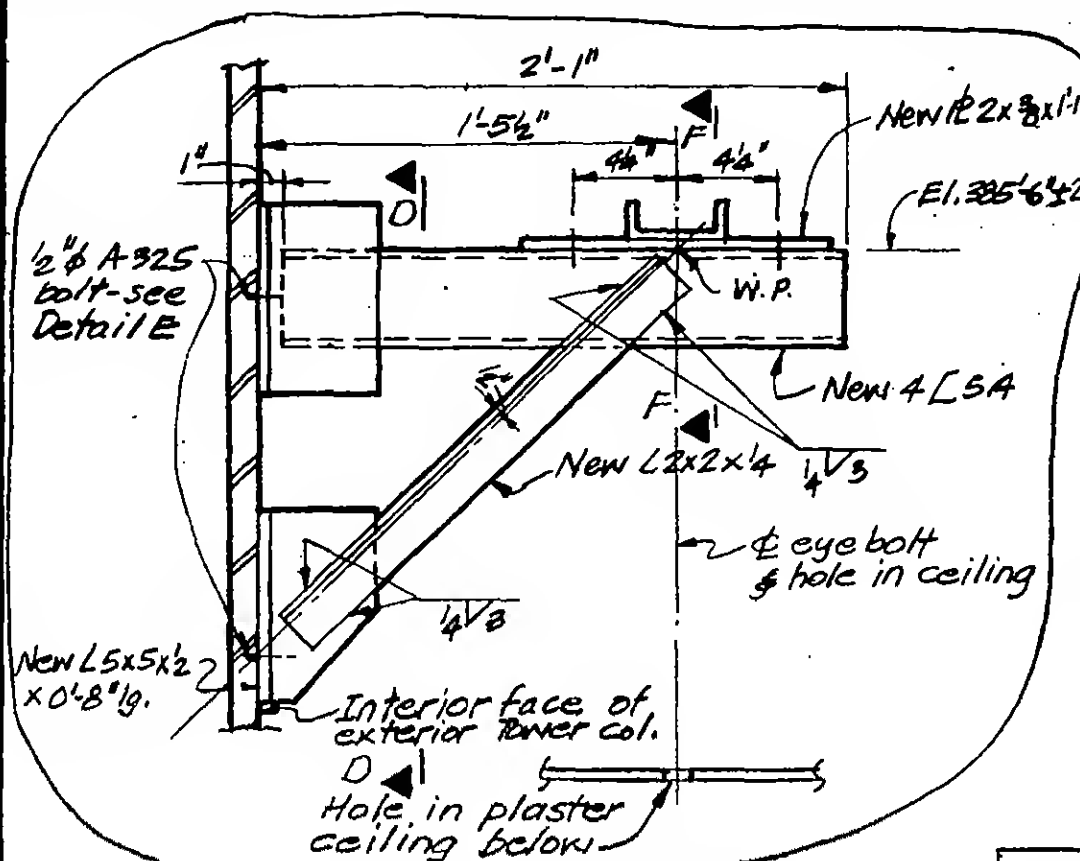
DESIGNED A.R.

DRAWN J.G.

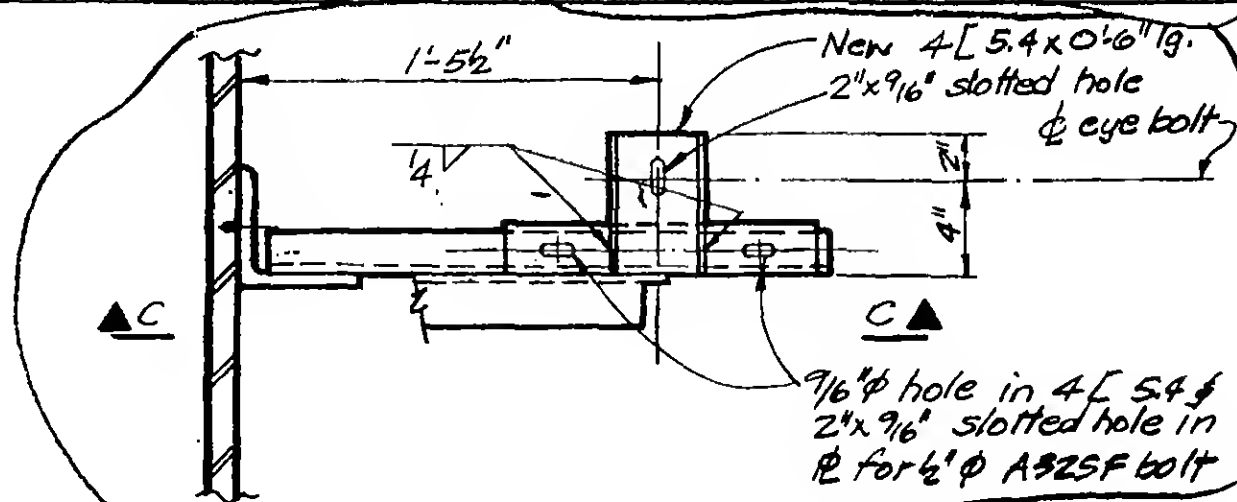
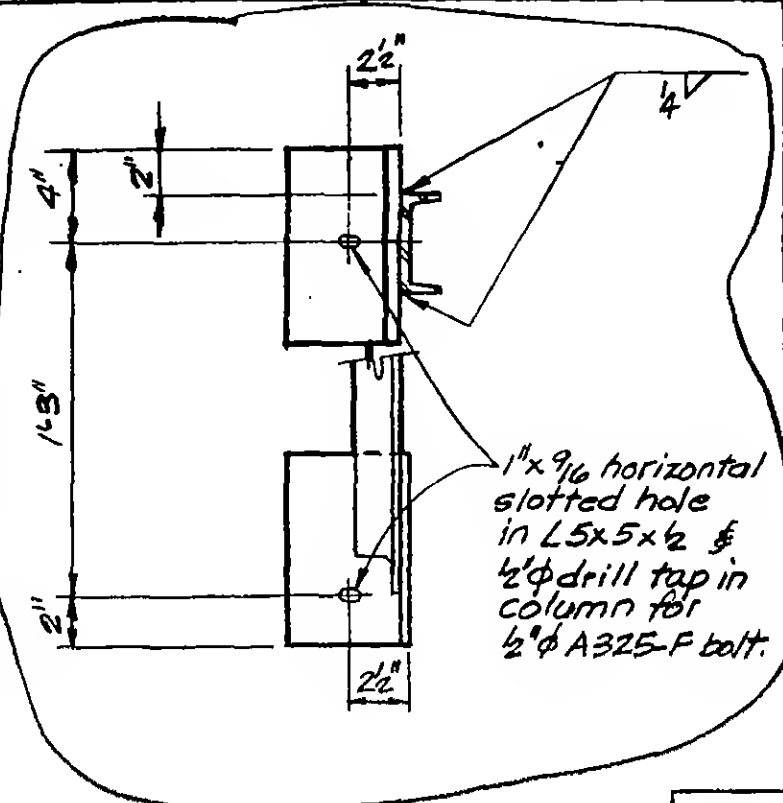
REVIEWED WAB

REVISIONS

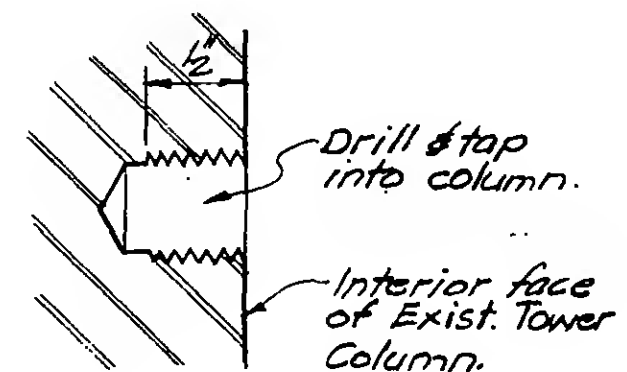
1-8-74



40 REQ'D PER TOWER



Plan



Drill and Tap Detail

1. Drill & tap holes in exterior column
2. Connect assembly to exterior column (all bolts finger tight), position eye-bolt over existing holes in plaster ceiling below.
3. Drop string line (i.e. "plumb-bob") through hole in plaster ceiling. Check to see that string line is not binding or rubbing on plaster ceiling hole, while adjusting all slotted hole connections.
4. Tighten all bolts.

Field Procedure

19-AB-1128.2



DISCLOSED

AE

DRAWN

PMD-JG

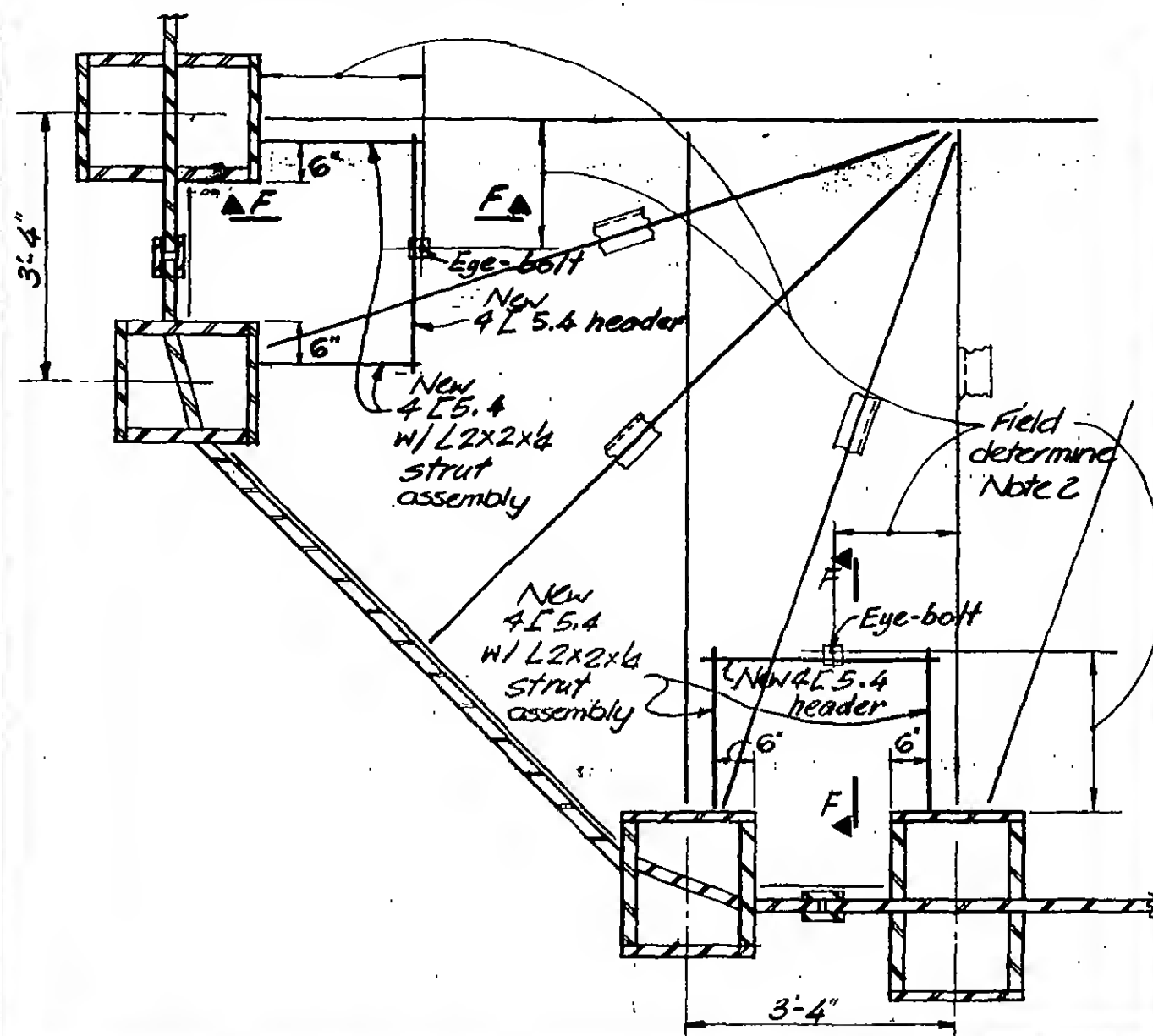
REVIEWED

WAB

PROJECT **THE WORLD TRADE CENTER**TITLE **TOWER A & B-LOBBY CEILINGS-WASHER SUPPORTS-CORNER**DATE **7-9-73**

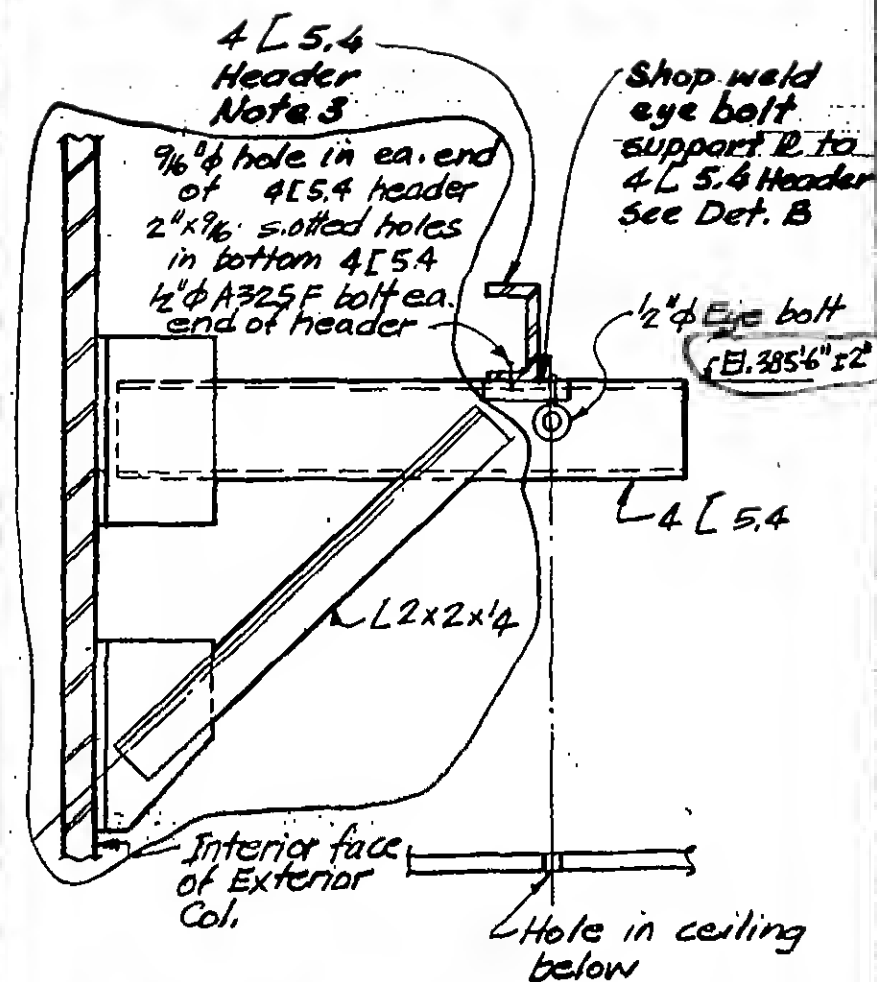
REVISIONS

1-8-74



Plan

4 CORNERS REQ'D PER TOWER



See sections C & D for information not shown

F

1. Drill & tap holes in exterior column.
2. Connect assembly to exterior column (all bolts finger tight, position eye-bolt over existing holes in plaster ceiling below)
3. Drop string line (i.e. plumb-bob) through hole in plaster ceiling. Check to see that string line is not binding or rubbing on plaster ceiling hole, while adjusting all slotted hole connections.
4. Tighten all bolts.

Field Procedure

19-AB-1128.3



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A.R.

DRAWN

J.G.

REVIEWED

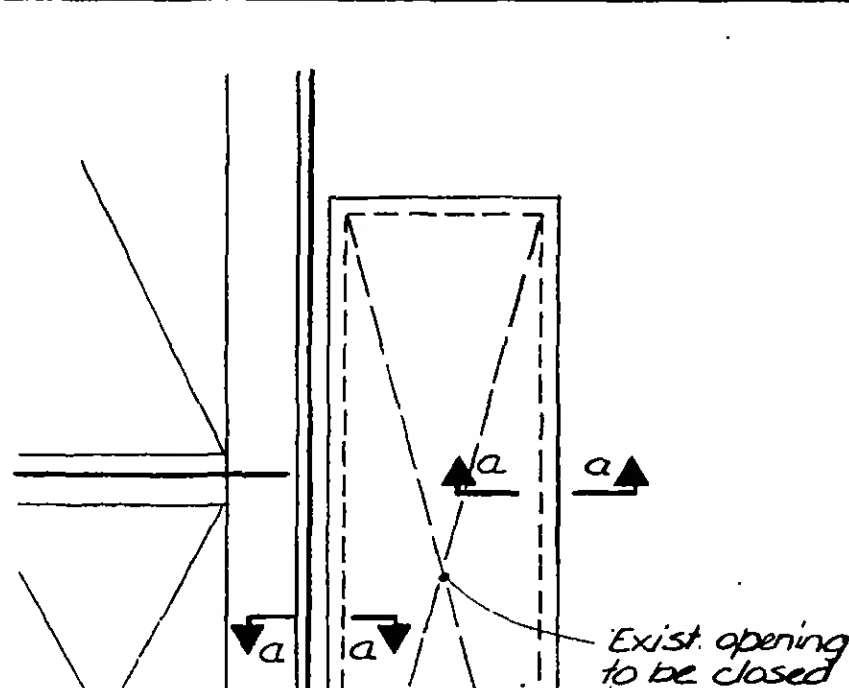
WAB

PROJECT THE WORLD TRADE CENTER

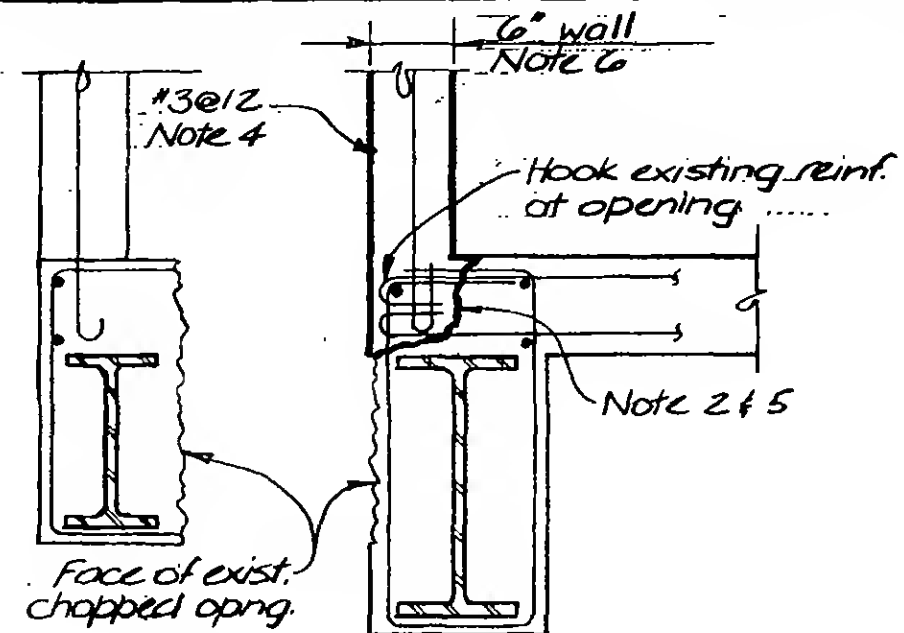
TITLE SLAB REPAIR - FLOOR 107 - TOWER A

DATE 7-31-73

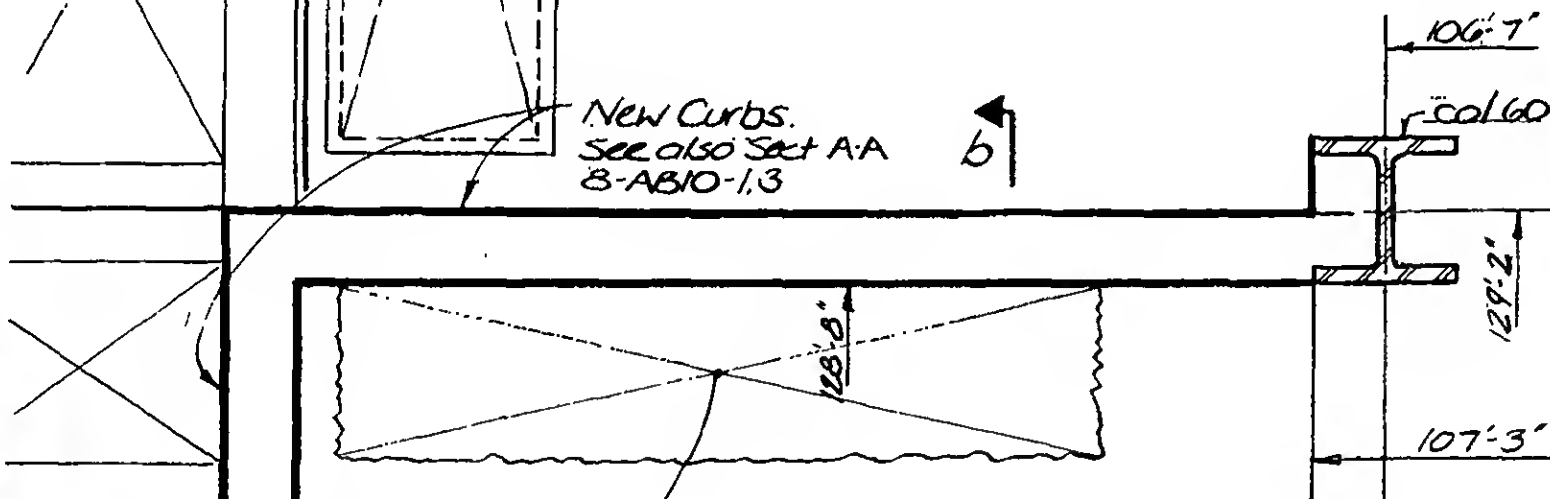
REVISIONS



New Curbs.
See also Sect A-A
B-AB10-1,3



Sect. b-b

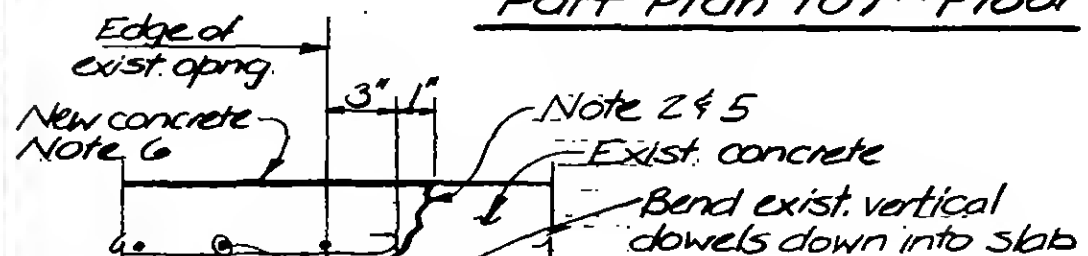


Notes:

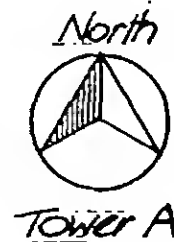
1. Slabs to be shored as req'd before removing existing concrete.
2. Remove existing concrete to line indicated without damaging existing reinf.
3. Cut existing reinf. and hook at edge of opening.
4. Add new reinf. as indicated
5. Clean face of existing concrete and thoroughly coat entire surface with epoxy bonding compound
6. Cast concrete to edge of opening using approved "non-shrink" f'c = 4000 psi concrete.

Exist. chopped opening
approx. 1'-4" x 4'-6"

Part Plan 107th Floor



Sect. a-a



DESIGNED

WAB

DRAWN

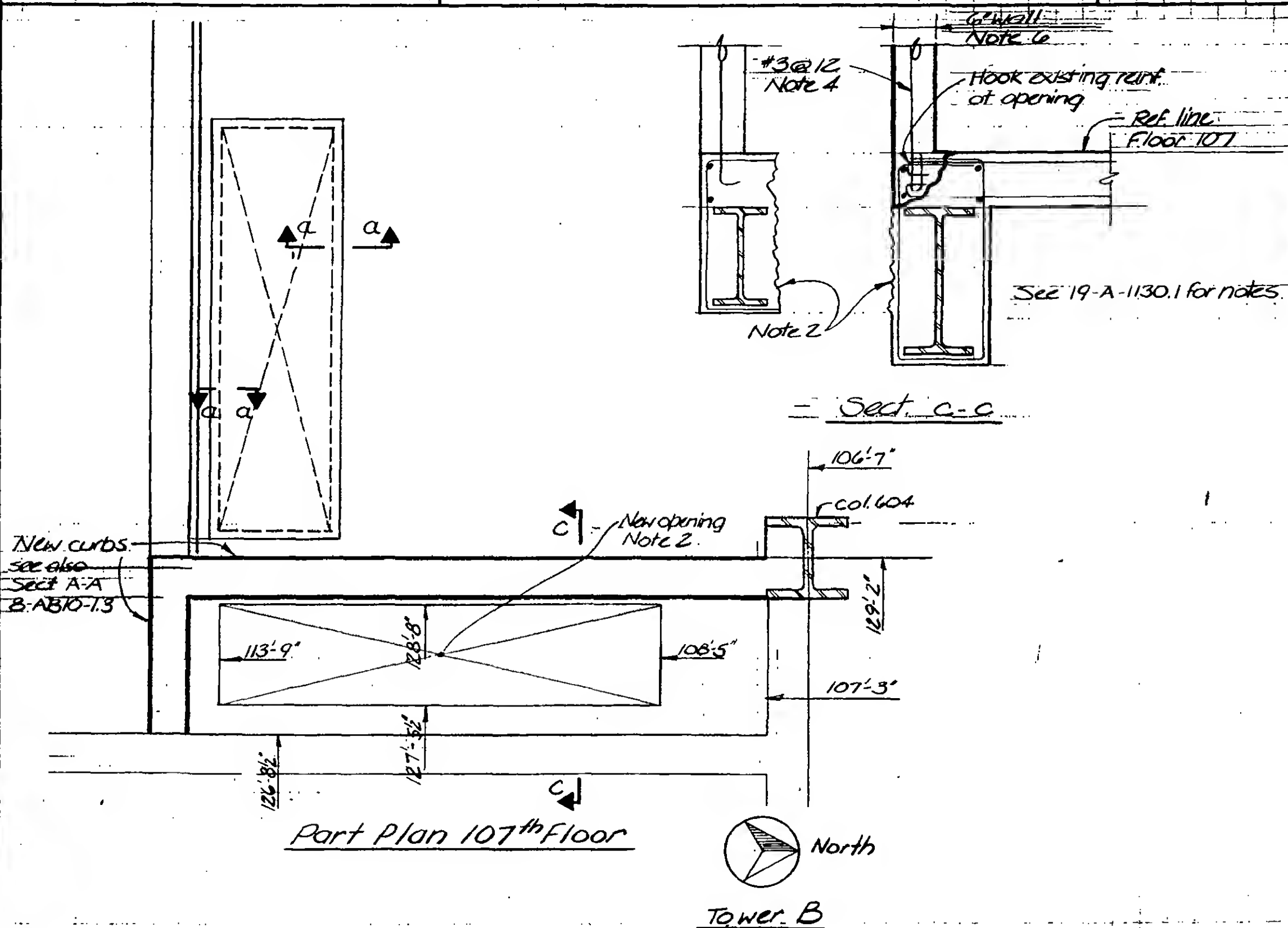
JB

REVIEWED

WAB

19-A-1130.1

→ REVISIONS



DESIGNCO

WAB

DRAWING

JES

REVIEWED

WAB

19-B-1130.2

PROJECT

THE WORLD TRADE CENTER

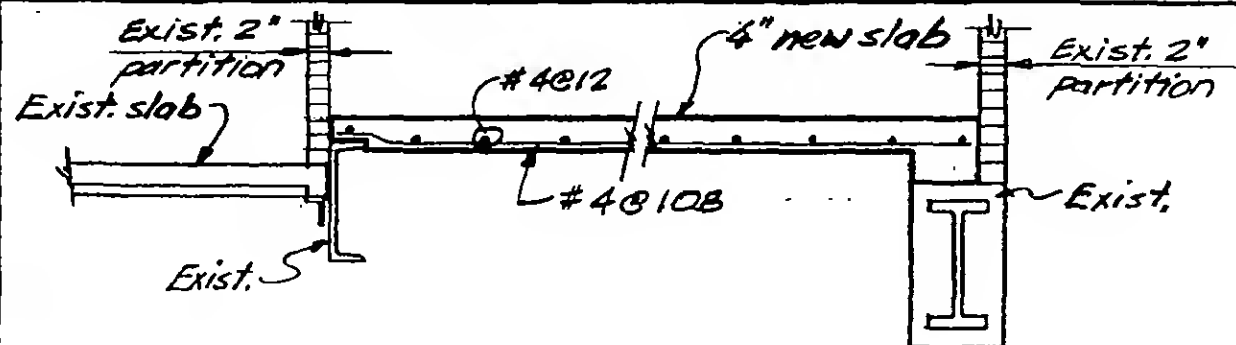
TITLE

TOWERS A & B - FLOOR 45 - SLAB OVER OPENINGS

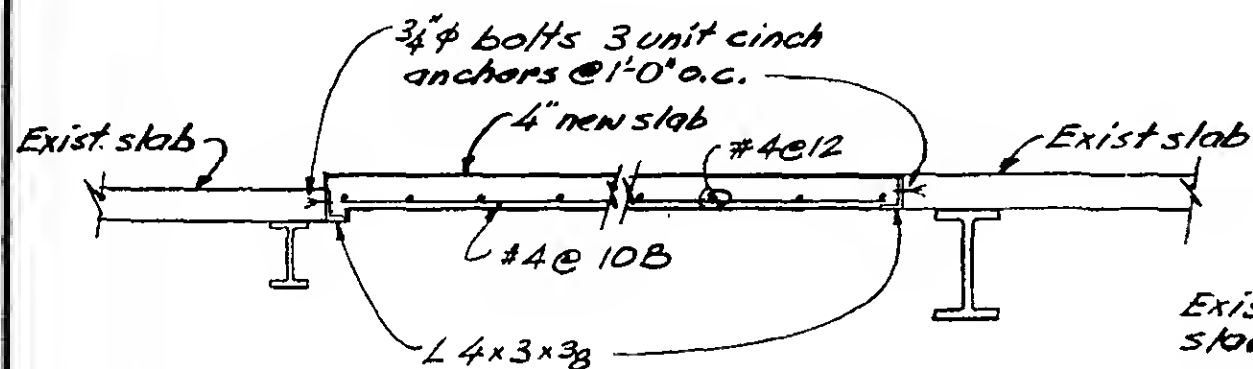
DATE

8-3-73

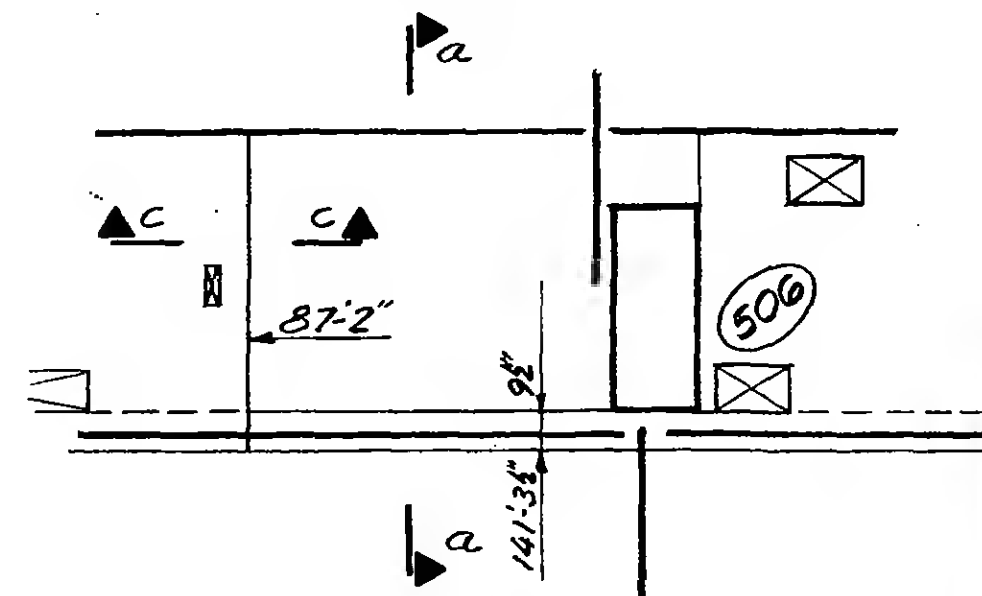
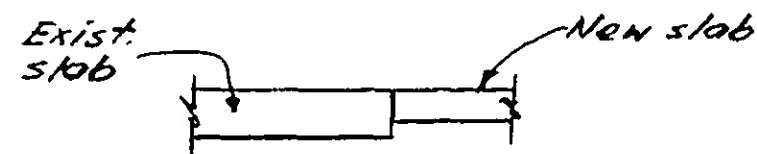
REVISIONS



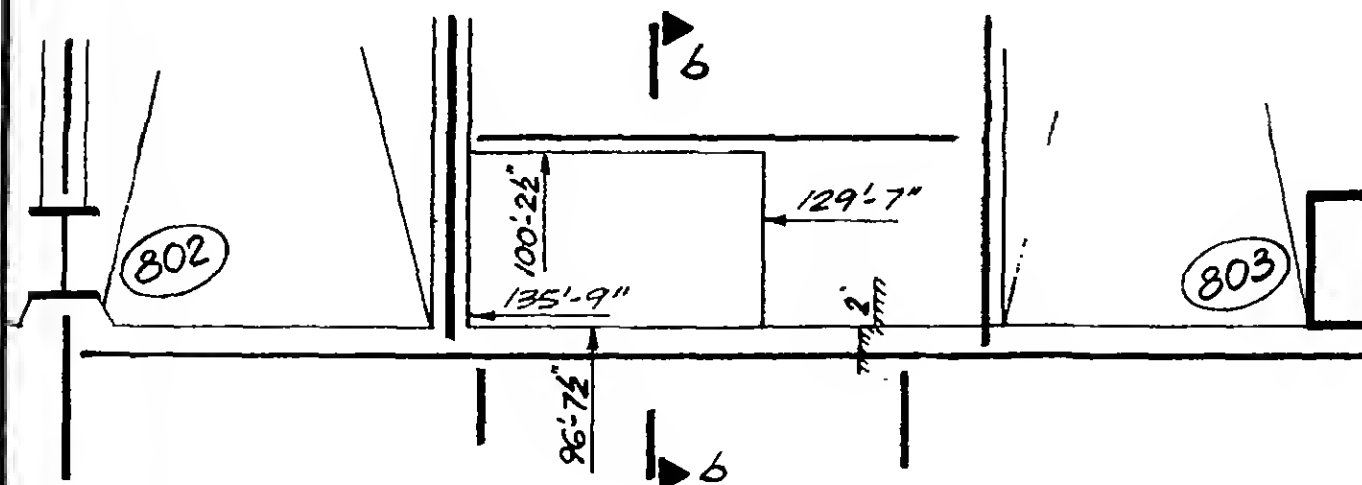
Section a-a



Section b-b

Part Plan 45th Floor Tower A & B

Section c-c

Part Plan 45th Floor TOWER A & B

DESIGNED

WAB

DRAWN

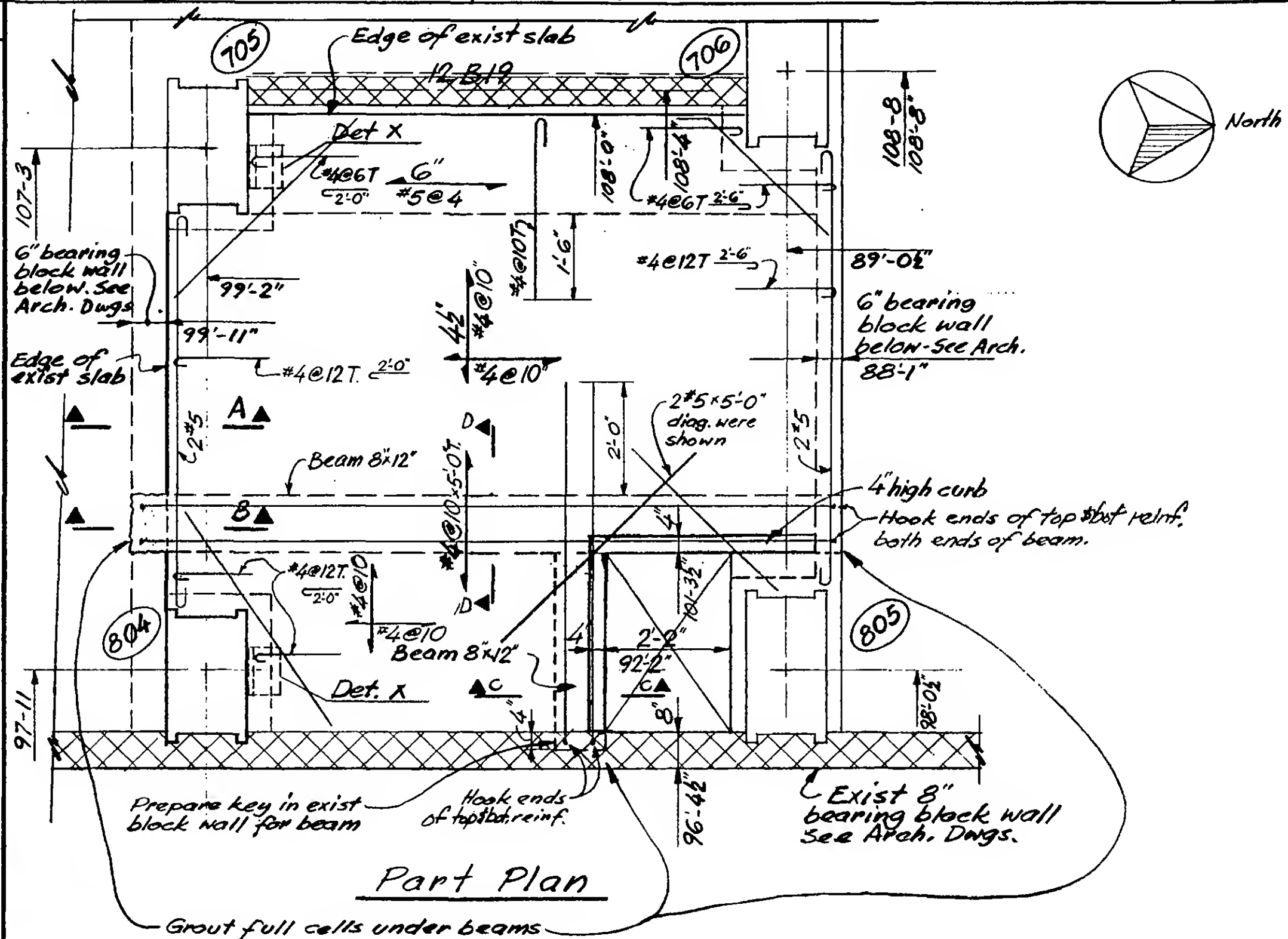
JG

REVIEWED

JTM

19AB-1131

REVISIONS



DESIGNED
JTM

DRAWN JG

REVIEWED
WAB

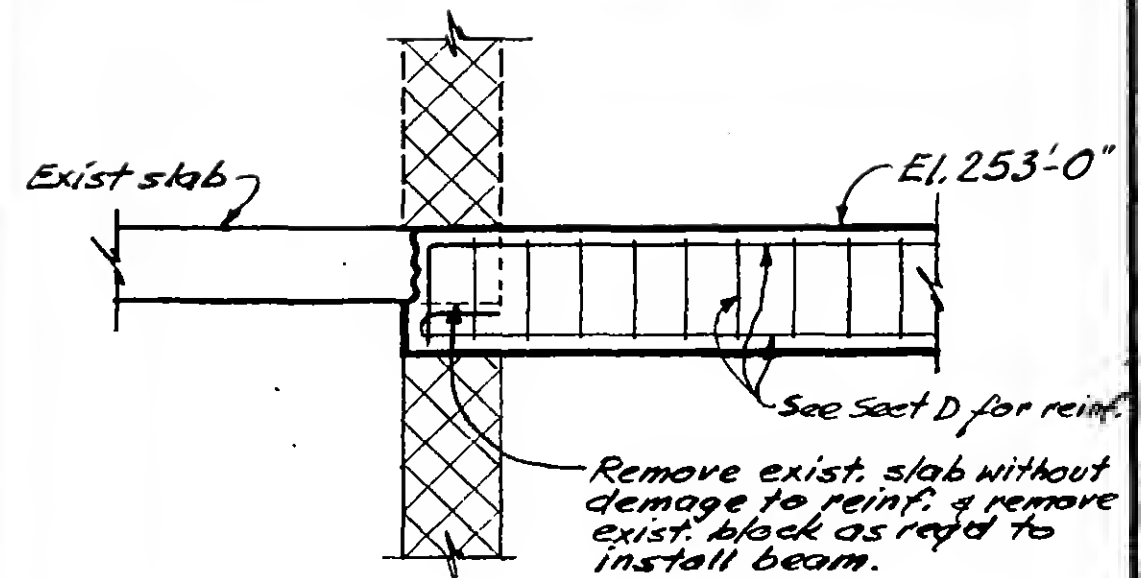
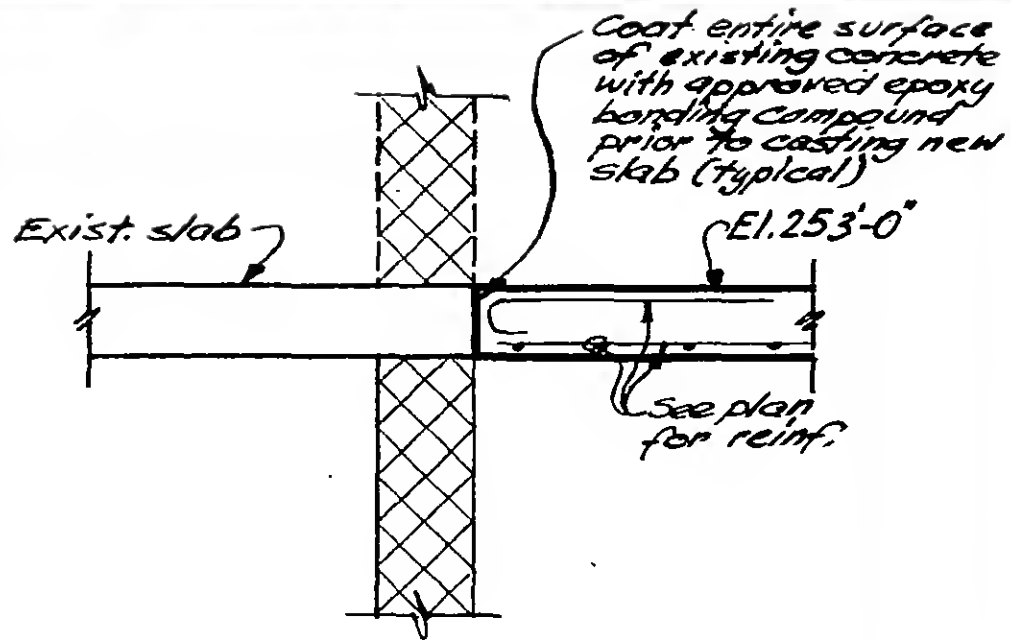
19-B-1132.1

PROJECT THE WORLD TRADE CENTER

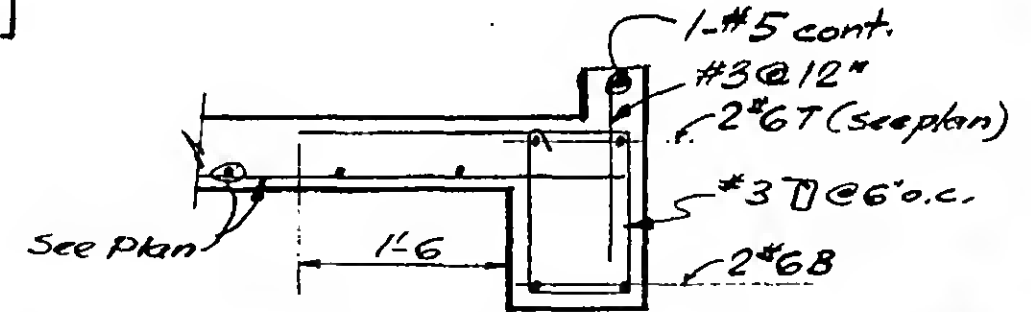
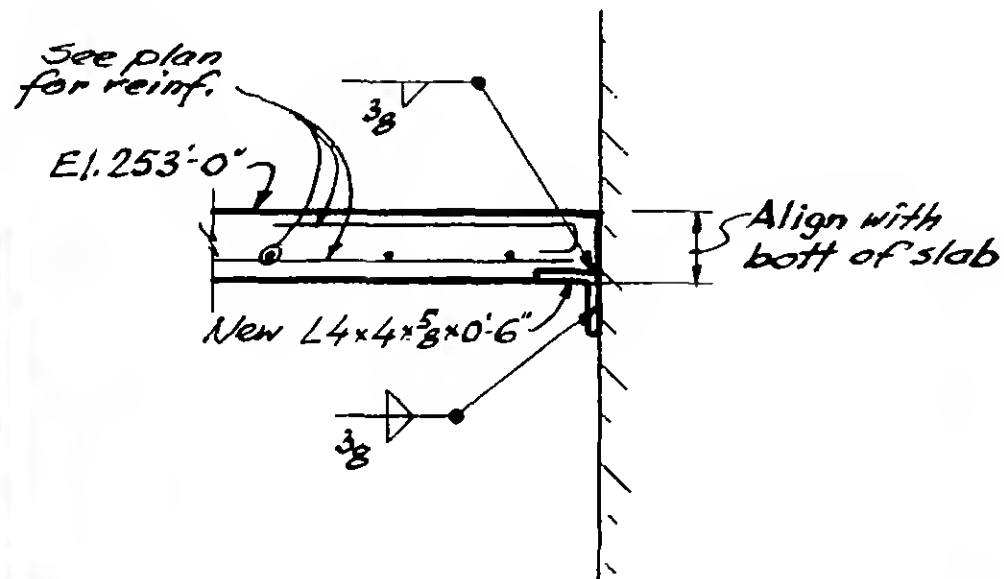
TITLE INSTALLATION OF OMITED SLAB TOWER B E/253

DATE 8-7-73

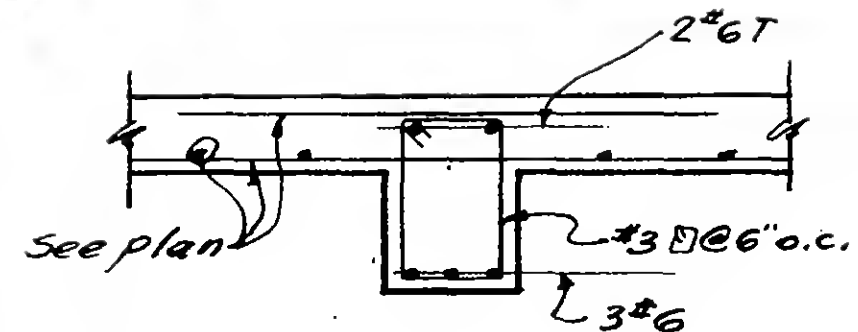
REVISIONS



| | |
|---|---|
| A | B |
| X | C |



D



DESIGNED

JTM

DRAWN

JG

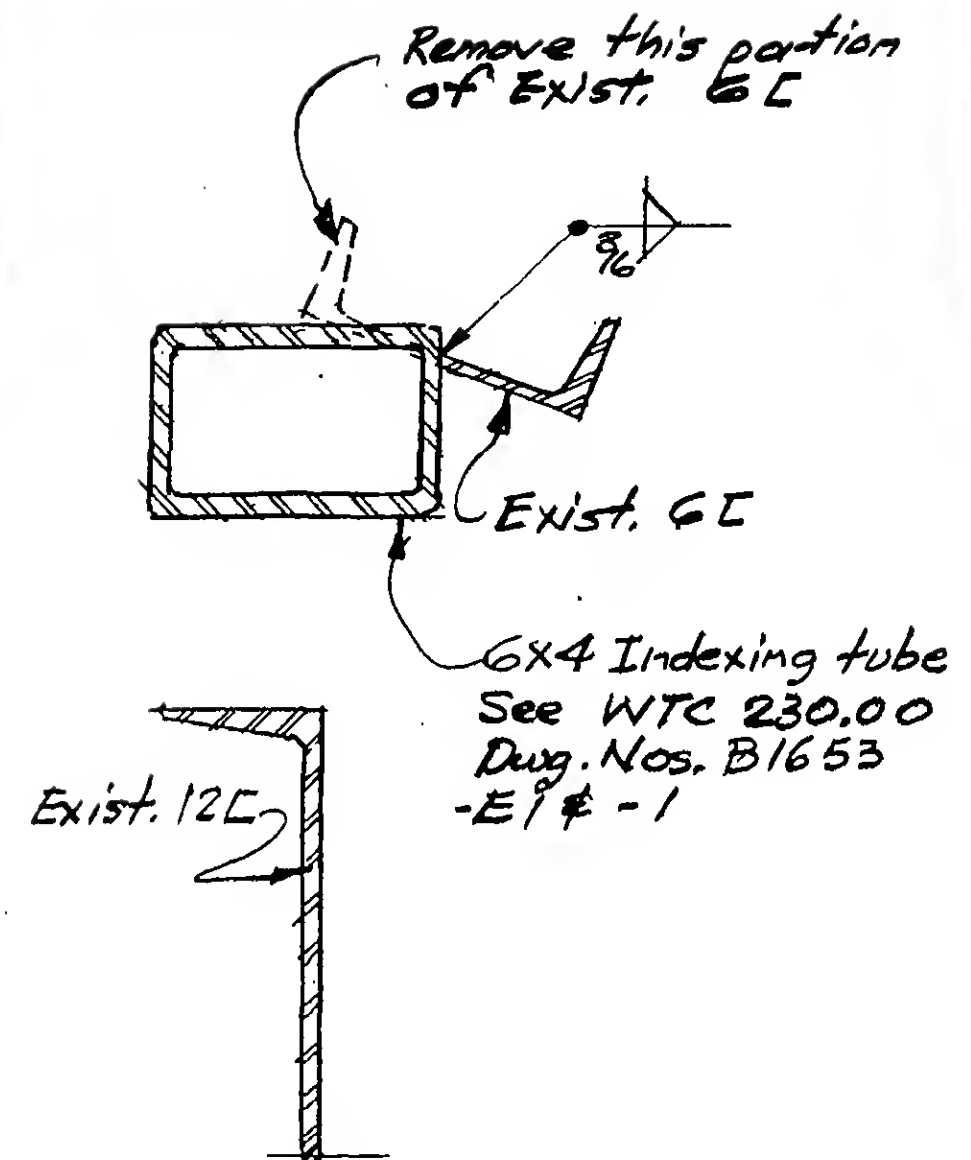
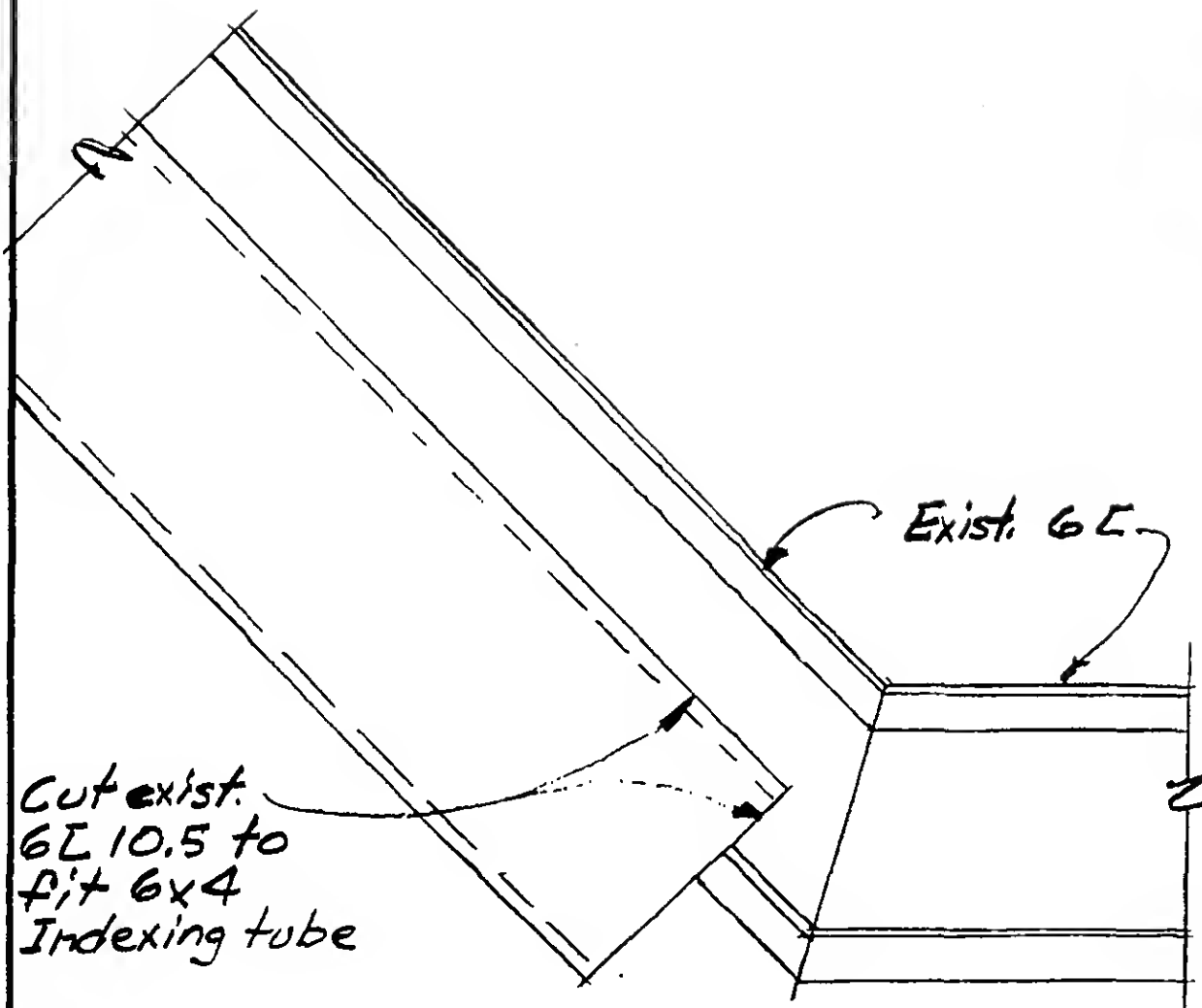
REVIEWED

WAB

19-B-1132.2

REVISIONS

8-17-73
General
Revisions



Note: Work with Contract
WTC 400.00 Sheet No. W-28 & W-29



DESIGNED

DRAWN

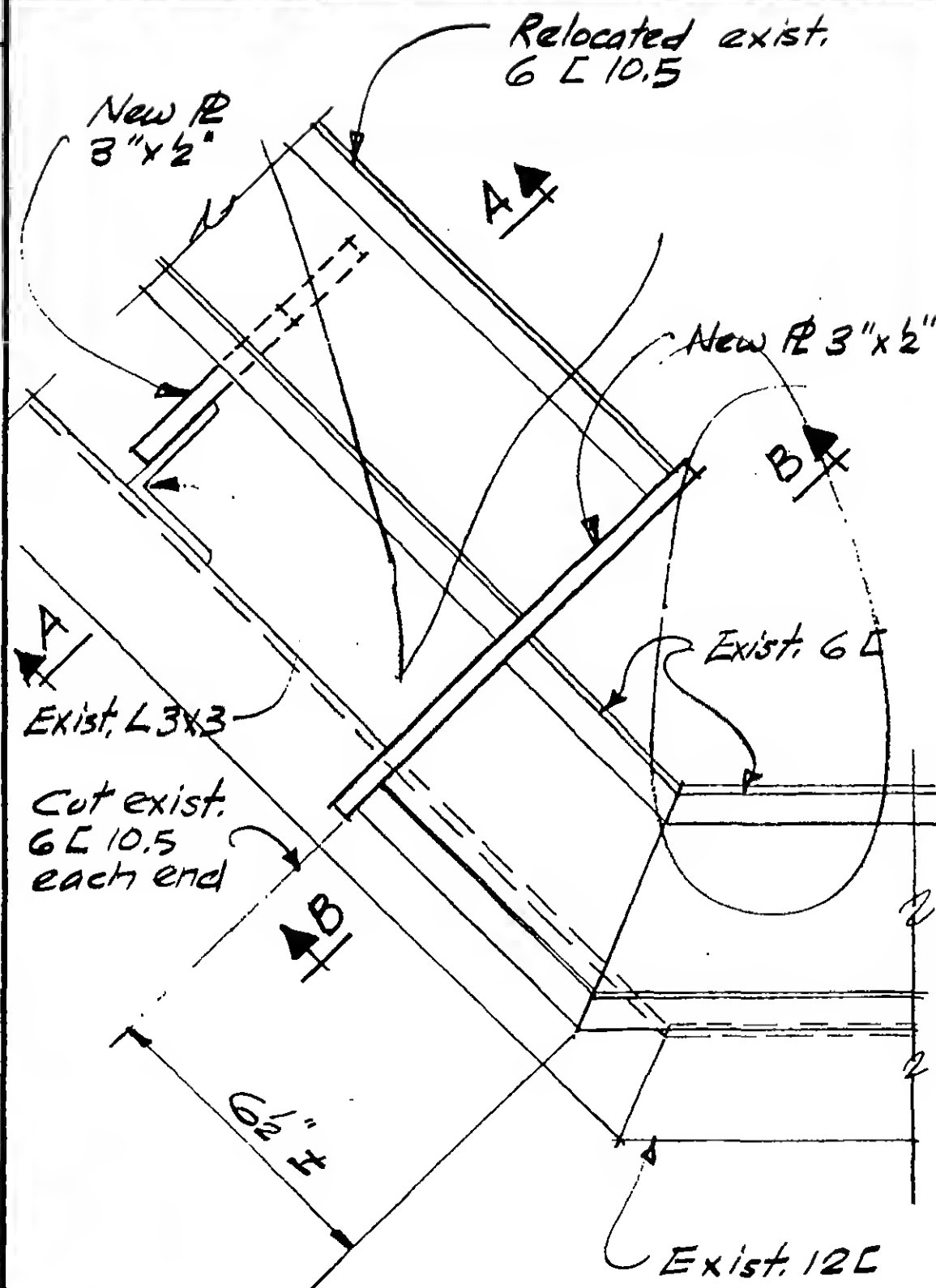
REVIEWED

PLAN A

19-AB-1133

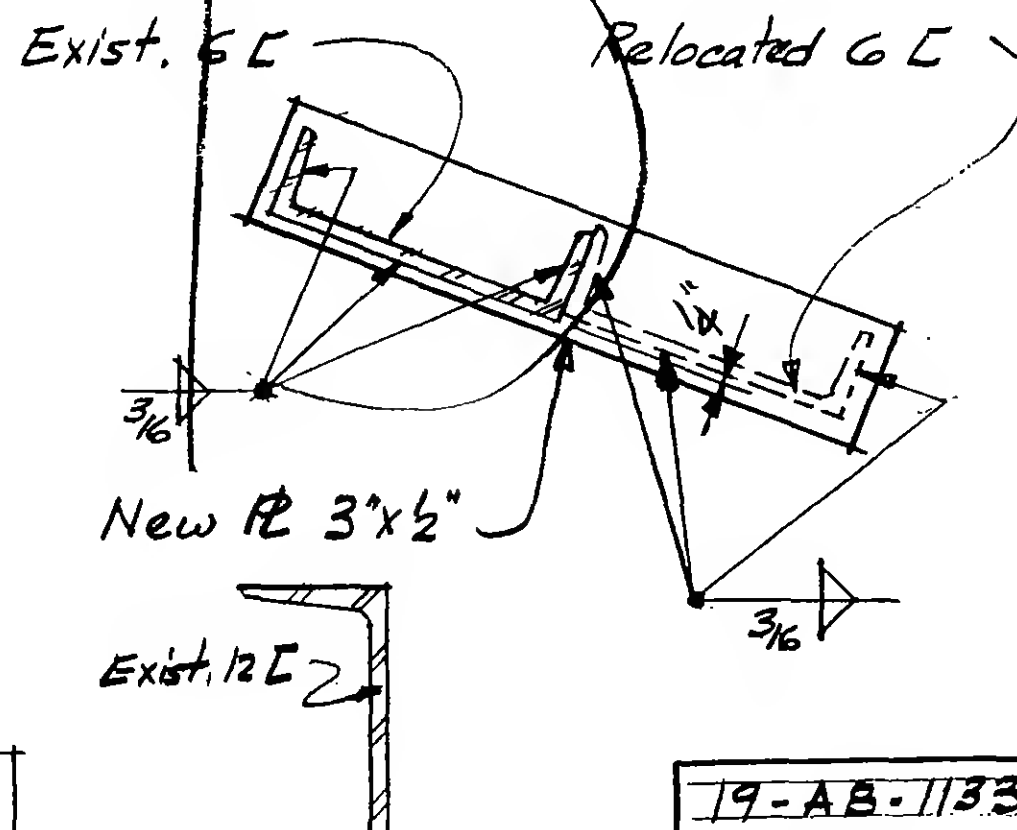
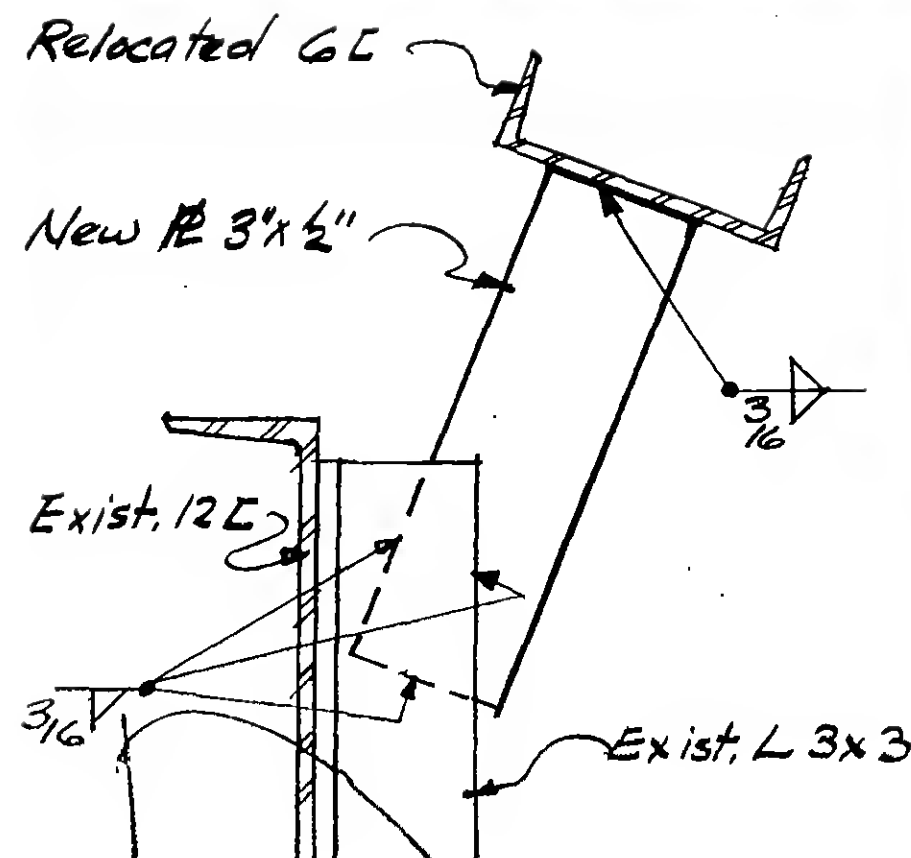
PROJECT THE WORLD TRADE CENTERTITLE CORNER SLOPING PARAPET-PH-TOWER A & BDATE 8-9-73

REVISIONS



Note: Work with contract
WTC 40000 Sheet No. W-28 & W-29

PLAN B



19-AB-1133



DESIGNED

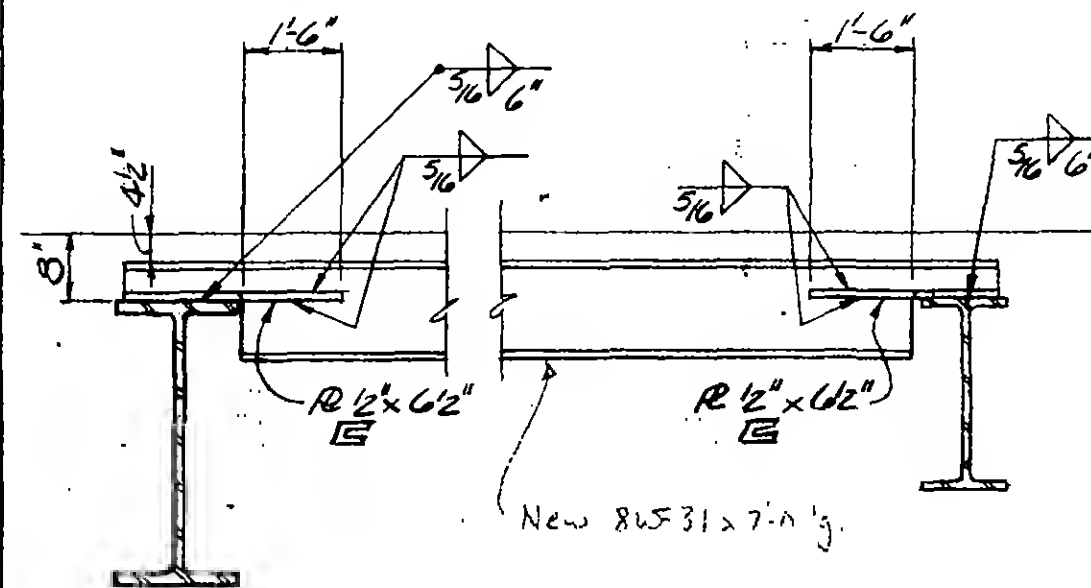
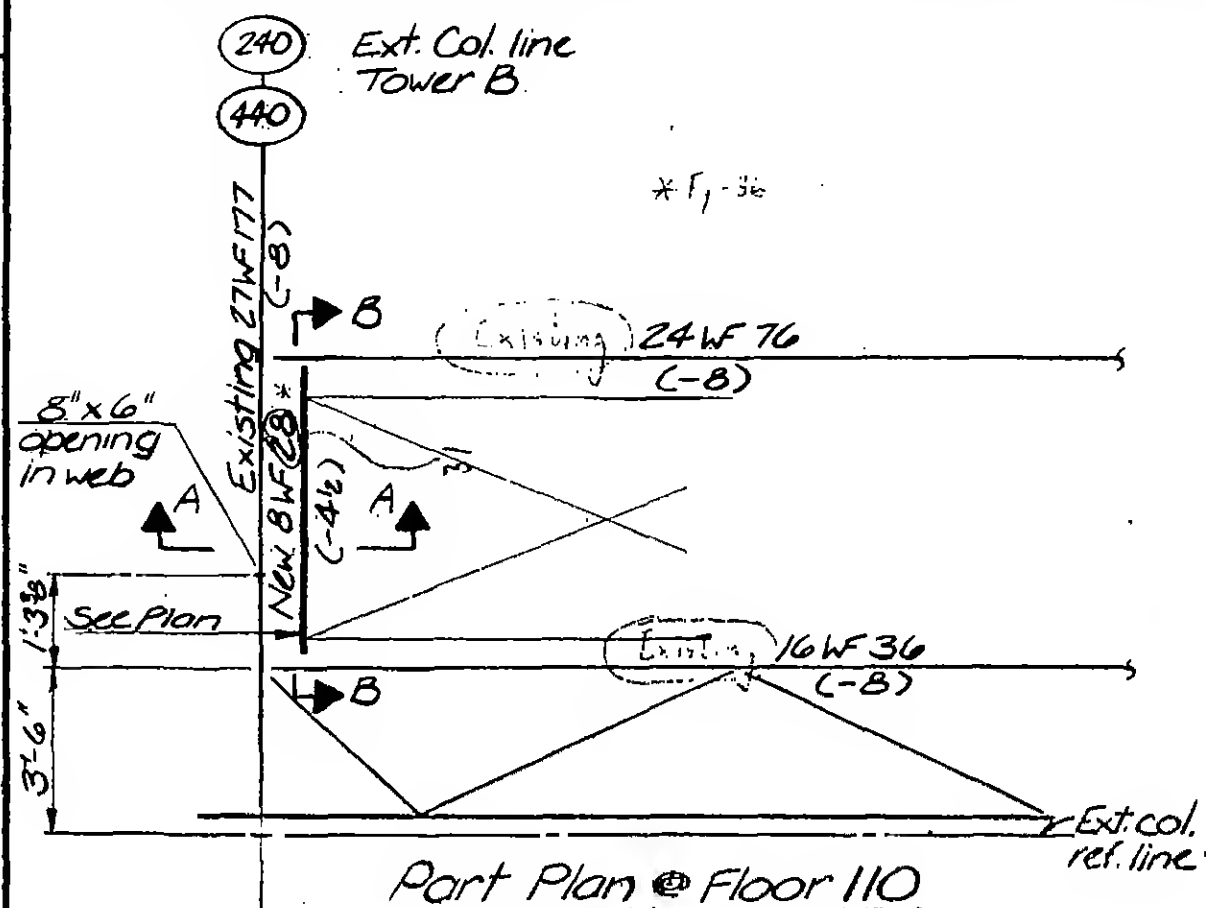
DRAWN

JA

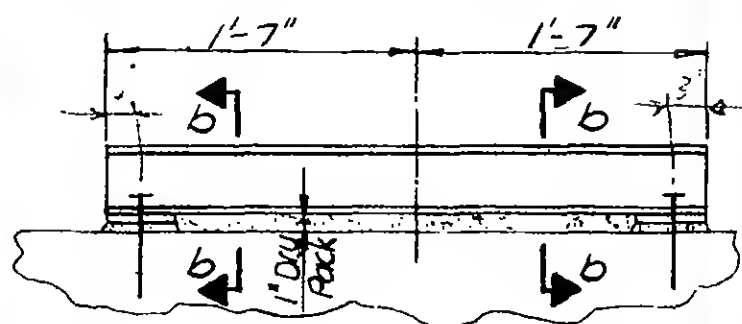
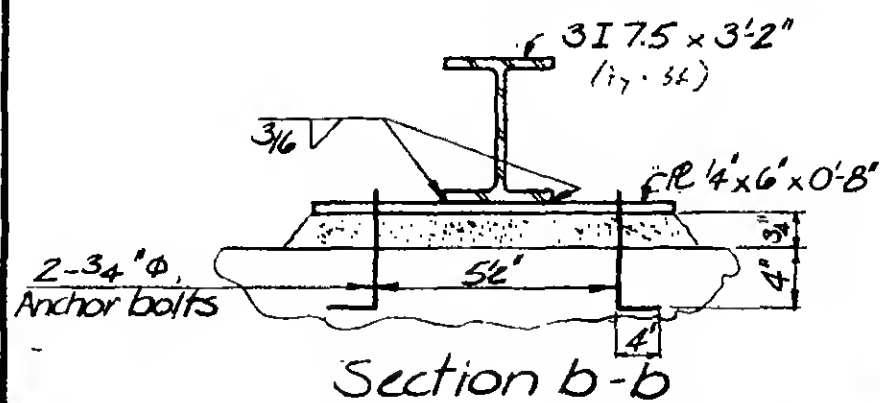
REVIEWED

WAB

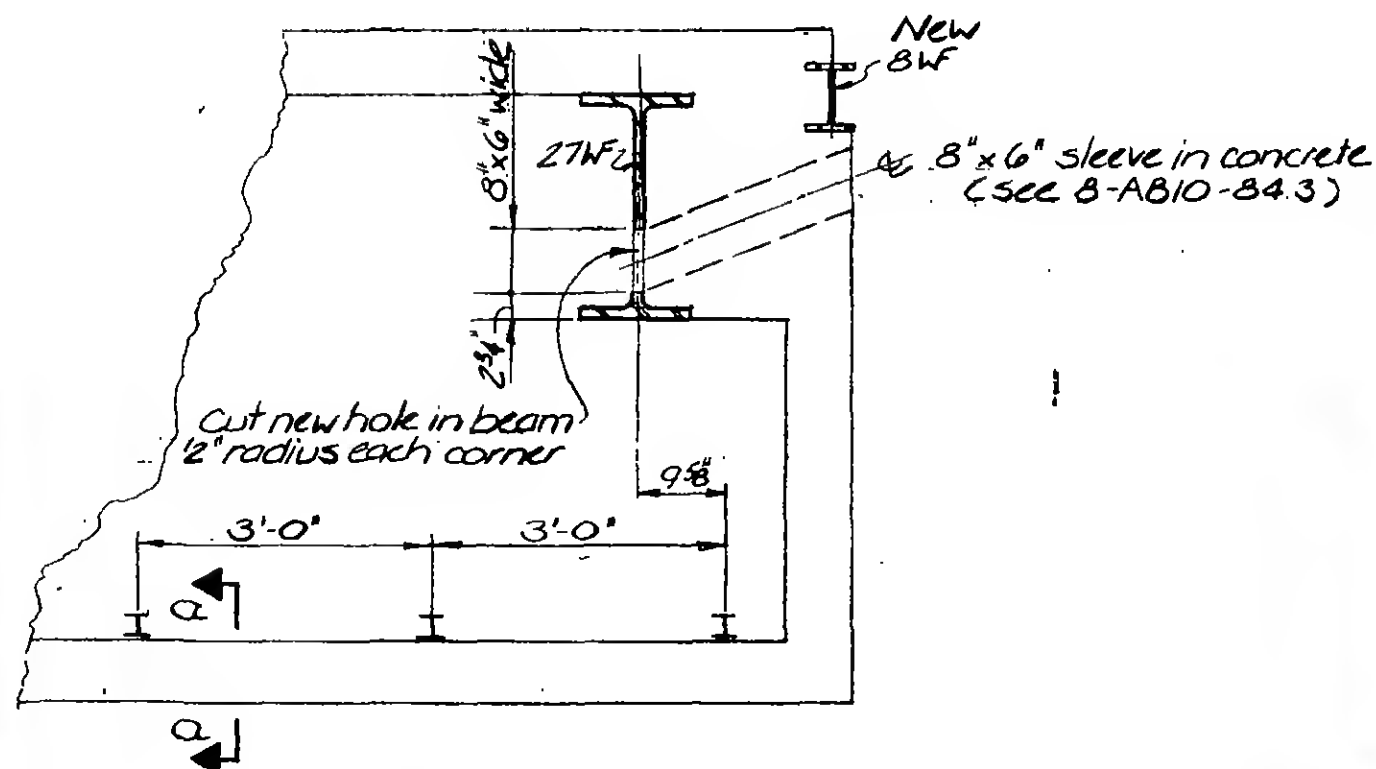
REVISIONS



Section B-B



Section a-a



Section A-A



DESIGNED
K. J. Chiang
DRAWN
J. Banks

REVIEWED

WAF

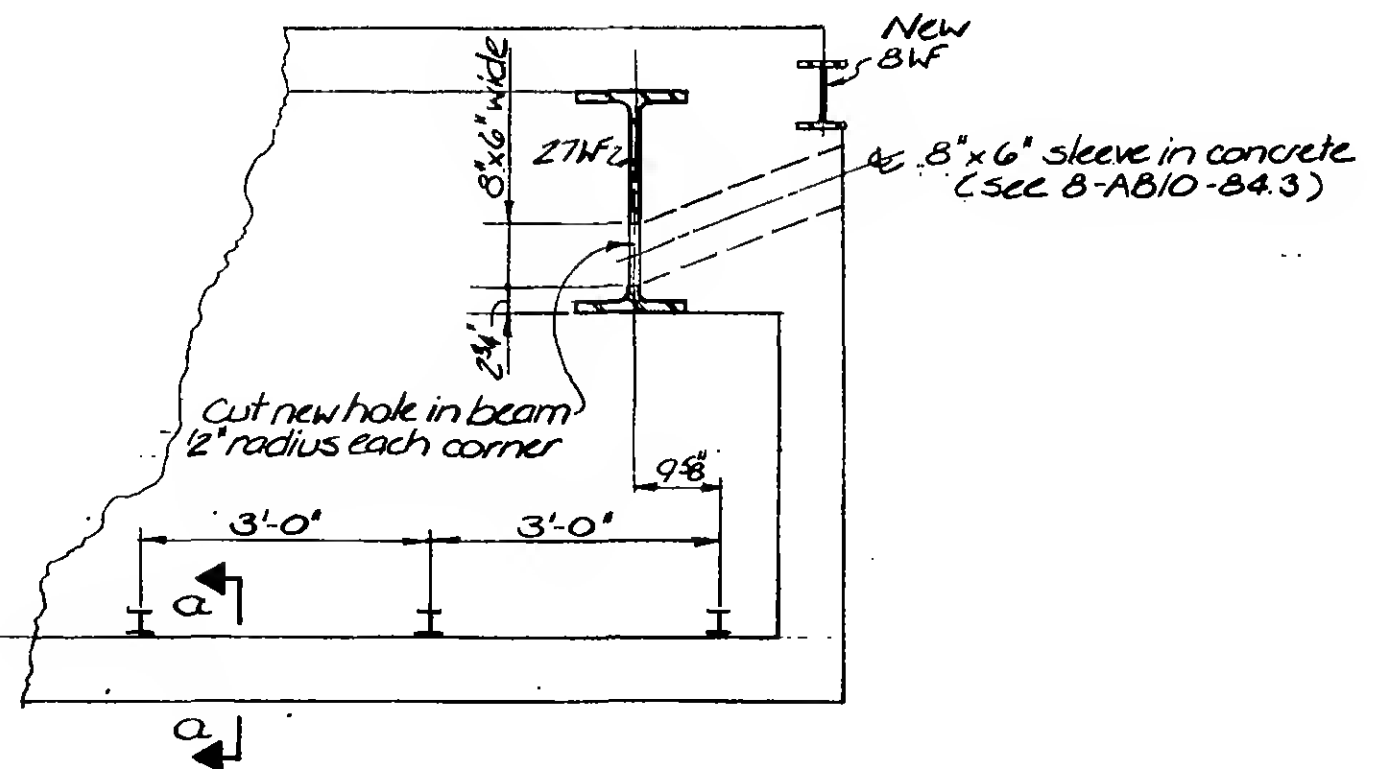
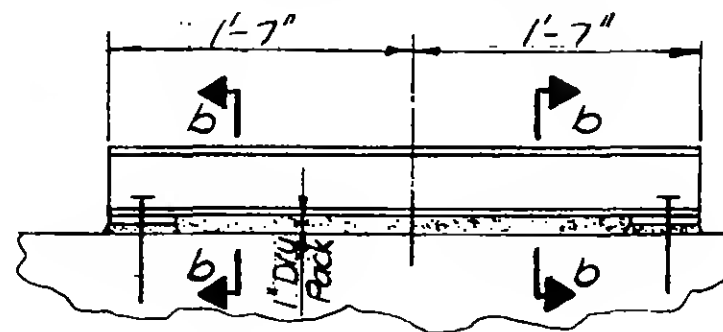
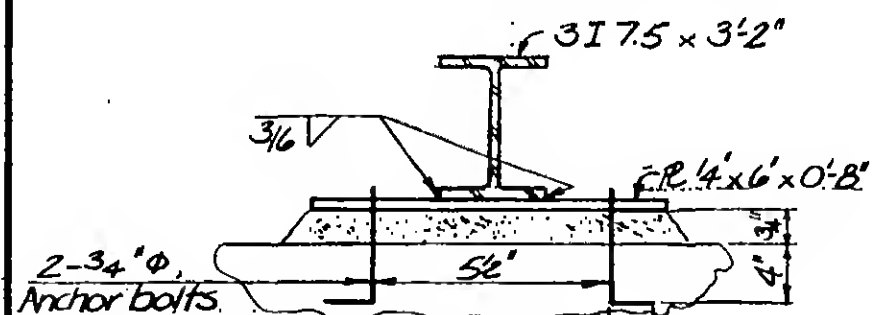
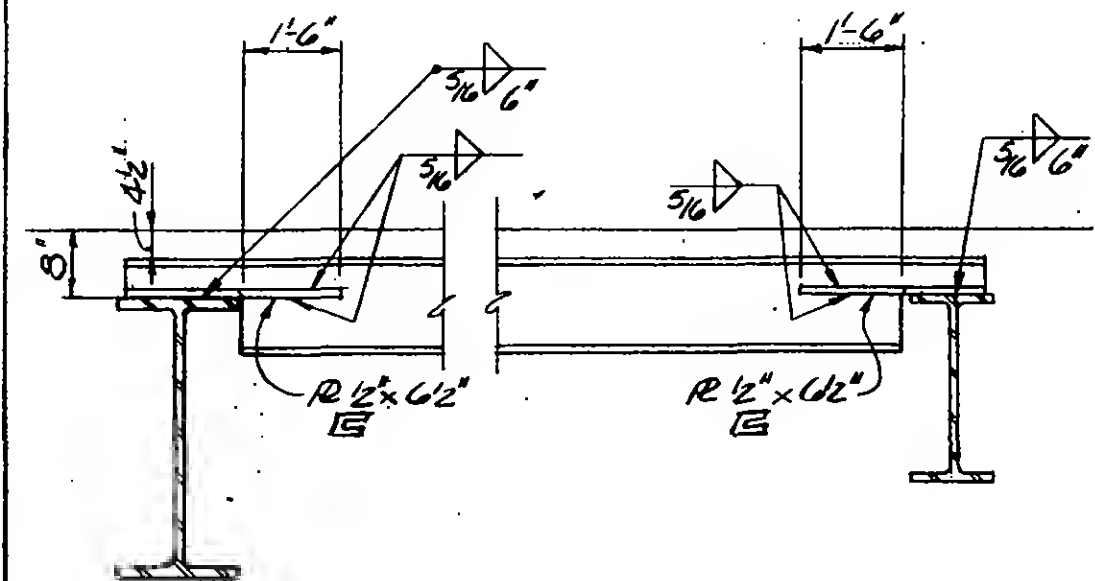
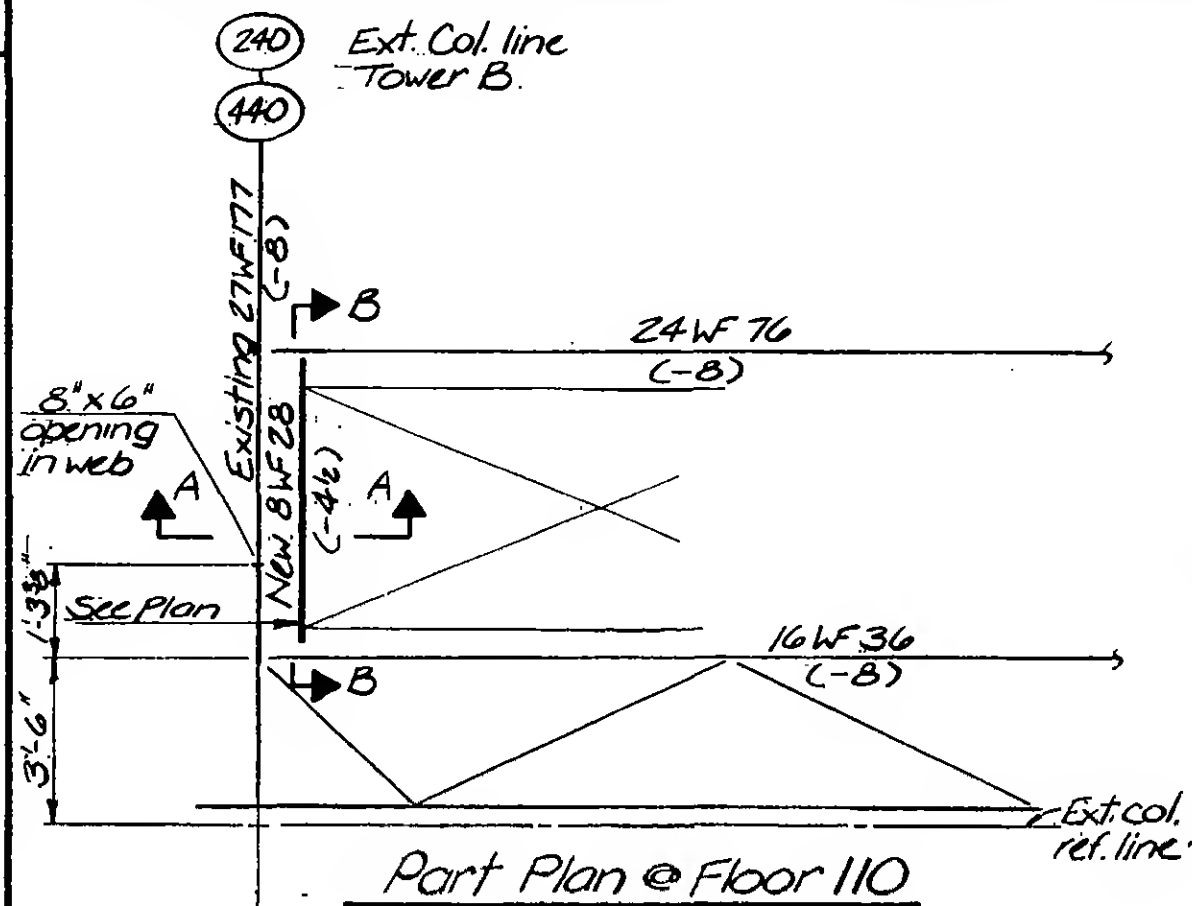
19-B-1135

PROJECT THE WORLD TRADE CENTER

TITLE BEAM DETAIL & CONNECTION AT ESCALATOR FL. 110

DATE 8-16-73

REVISIONS



DESIGNED J. Chiang

DRAWN J. Banks

REVIEWED

19-B-1135

PROJECT

THE WORLD TRADE CENTER

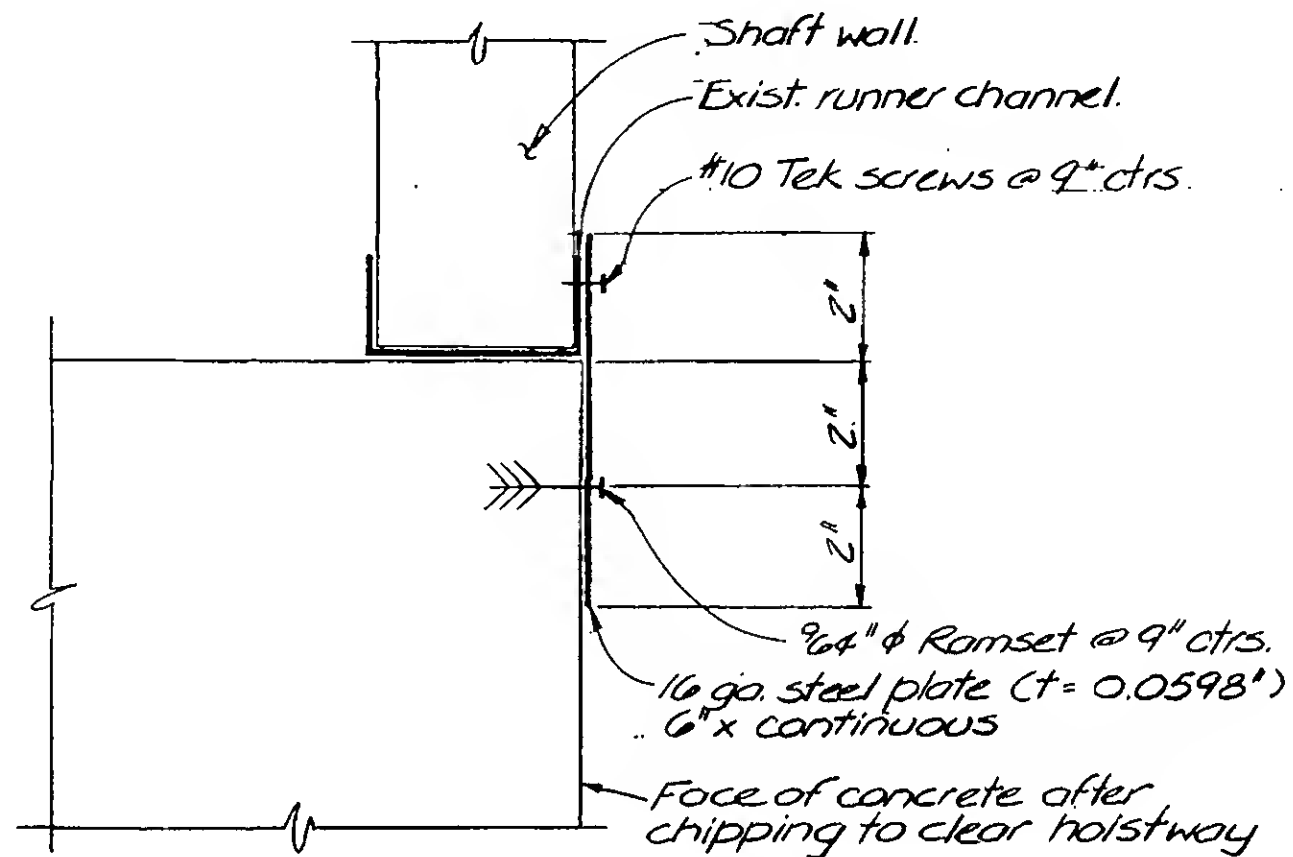
TITLE

SHAFT WALL ANCHORAGE DETAIL

DATE

9-24-73

REVISIONS



Tower B - Passenger Elevators #18 & 19
 Detail at Bottom of Partition at shaft Opening.

- Notes:
1. Detail at top of partition similar
 2. Use this detail only at locations directed by Engineer



DESIGNED

J.T.M.

DRAWN

J. Banks

REVIEWED

J.T.M.

19-B-1136

PROJECT THE WORLD TRADE CENTER

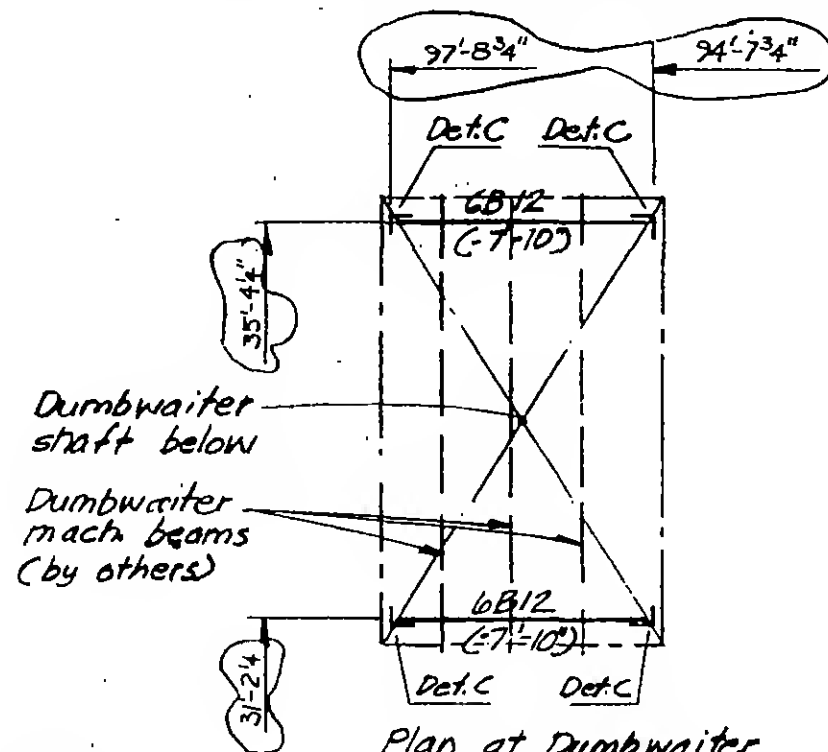
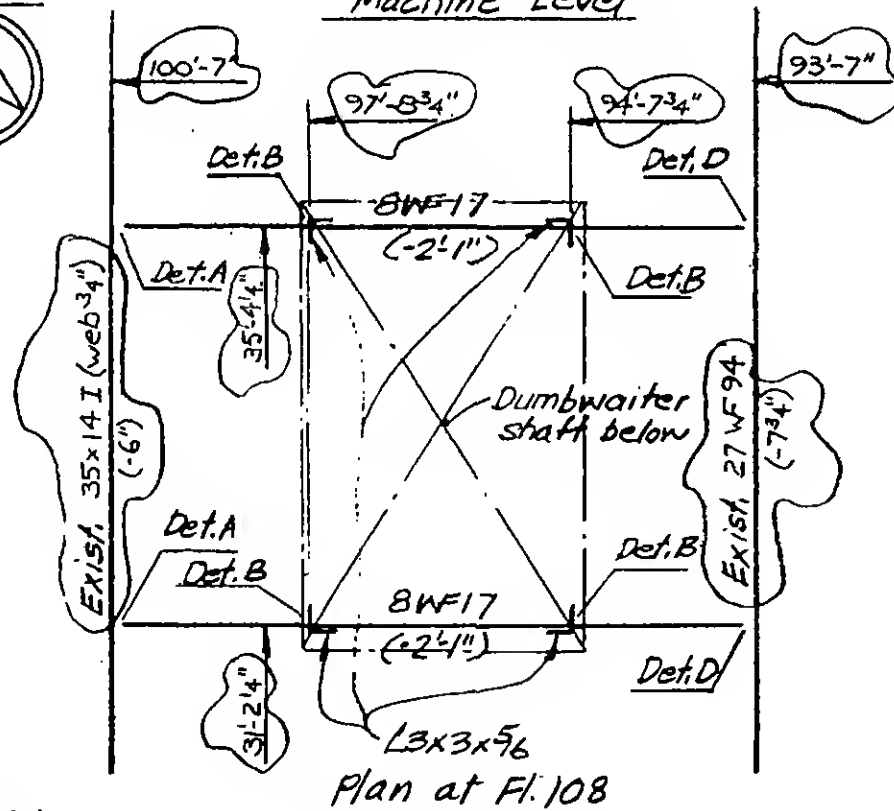
TITLE DUMBWAITER MACHINE SUPPORT-FLOOR 108

DATE 12-28-73

REVISIONS

1-3-74

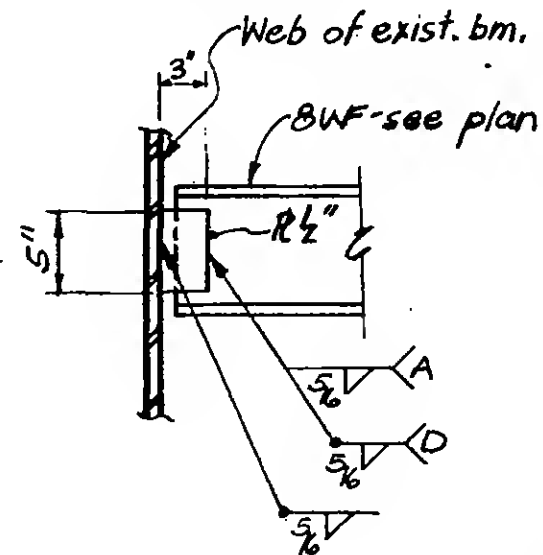
6-26-74

Plan at Dumbwaiter
Machine Level

Plan at Fl. 108

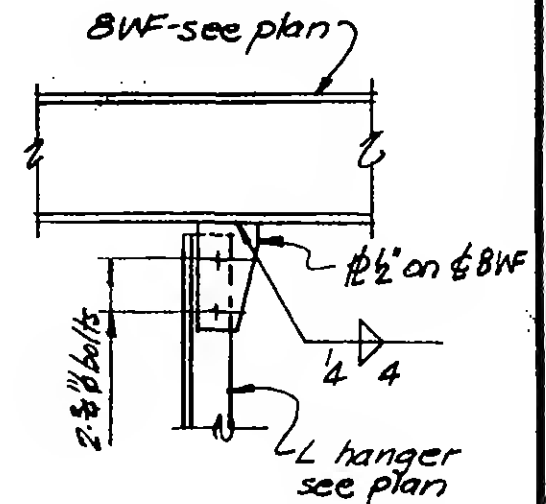
Notes:

1. Verify dimensions and location of existing beams in field before fabrication of new work.
2. Top of beam elevations are given thus (-2'-1") from reference Fl. 108, El. 1631'-10", Tower A

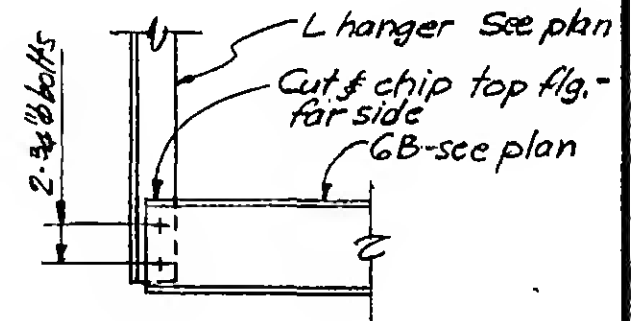


A

D



B



C



DESIGNED

JTM

DRAWN

M. M. M.

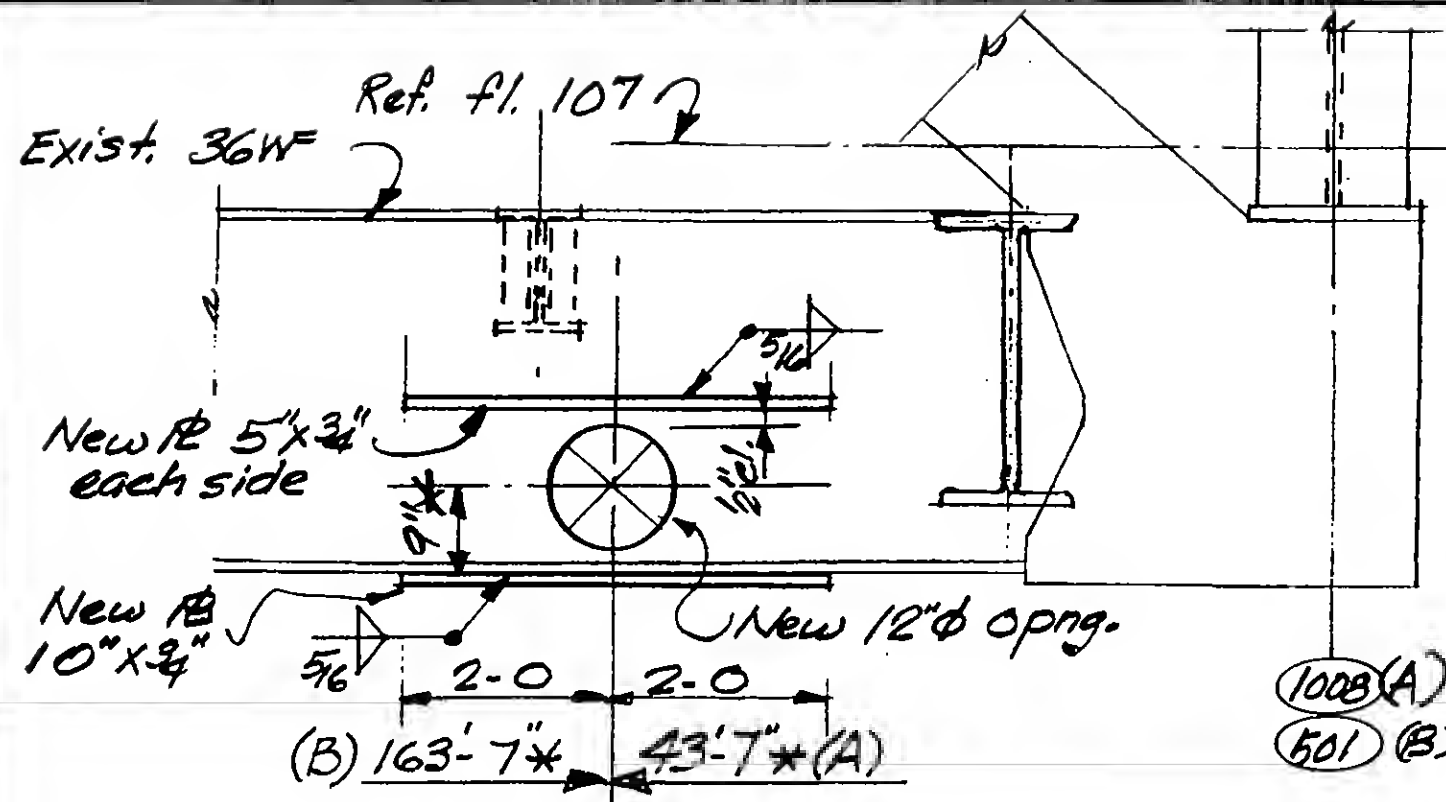
REVIEWED

WAB

19-A-1137

PROJECT THE WORLD TRADE CENTERTITLE NEW BEAM OPENING - TOWER B - FLOOR 107DATE 1-15-74

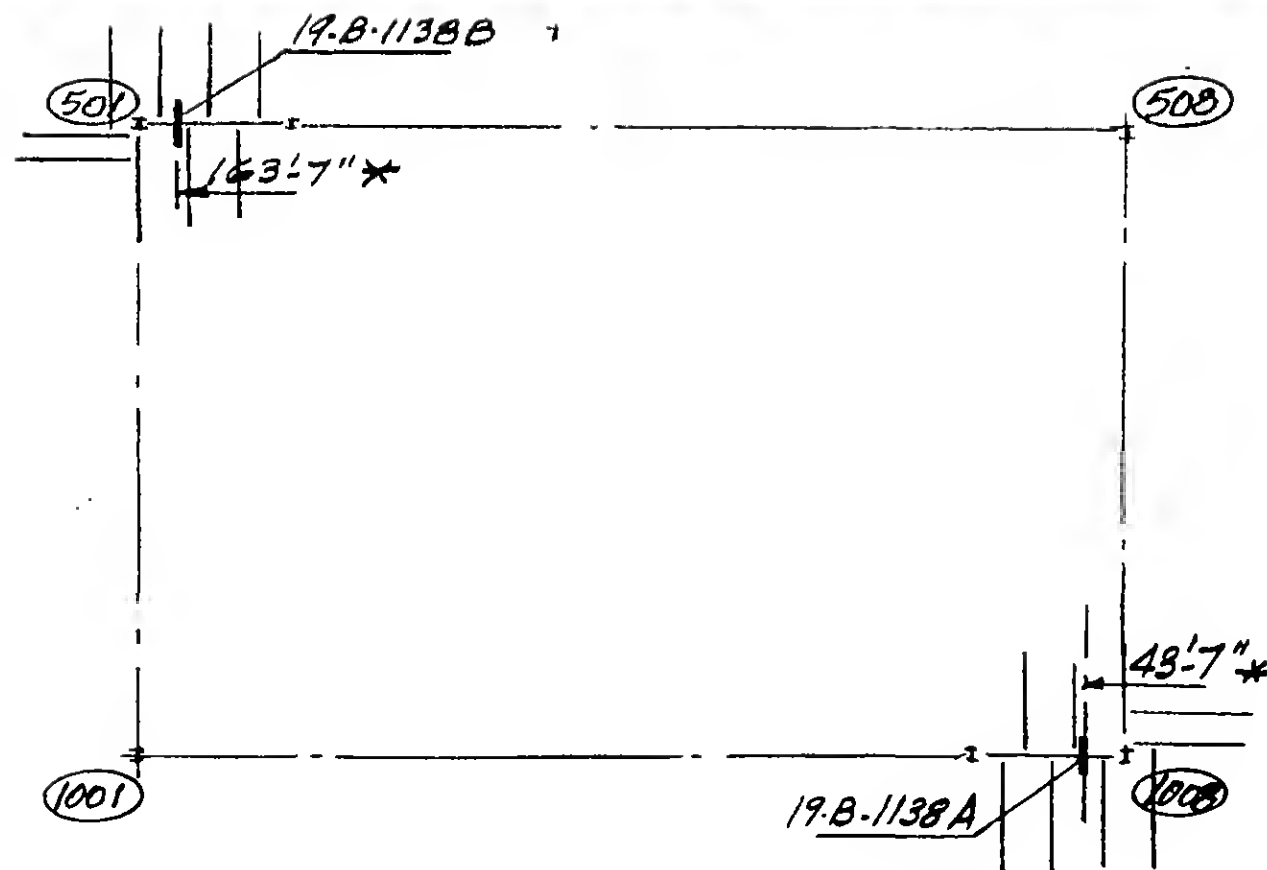
REVISIONS



Note: Weld new plates to
beam before cutting
new opening

* Verify in field to
align opening with
existing pipe

KEY PLAN



Ref: SB-115
Framing Plan
Floor 107



DESIGNED

DRAWN

REVIEWED

WAB

19-B-1138

LEGEND

RB = REINFORCE
BEAM

RC = COLUMN

RT = TRUSS

RO = OPENING

RS = SLAB

RCN = CONNECTION

999 = LERA JOB #

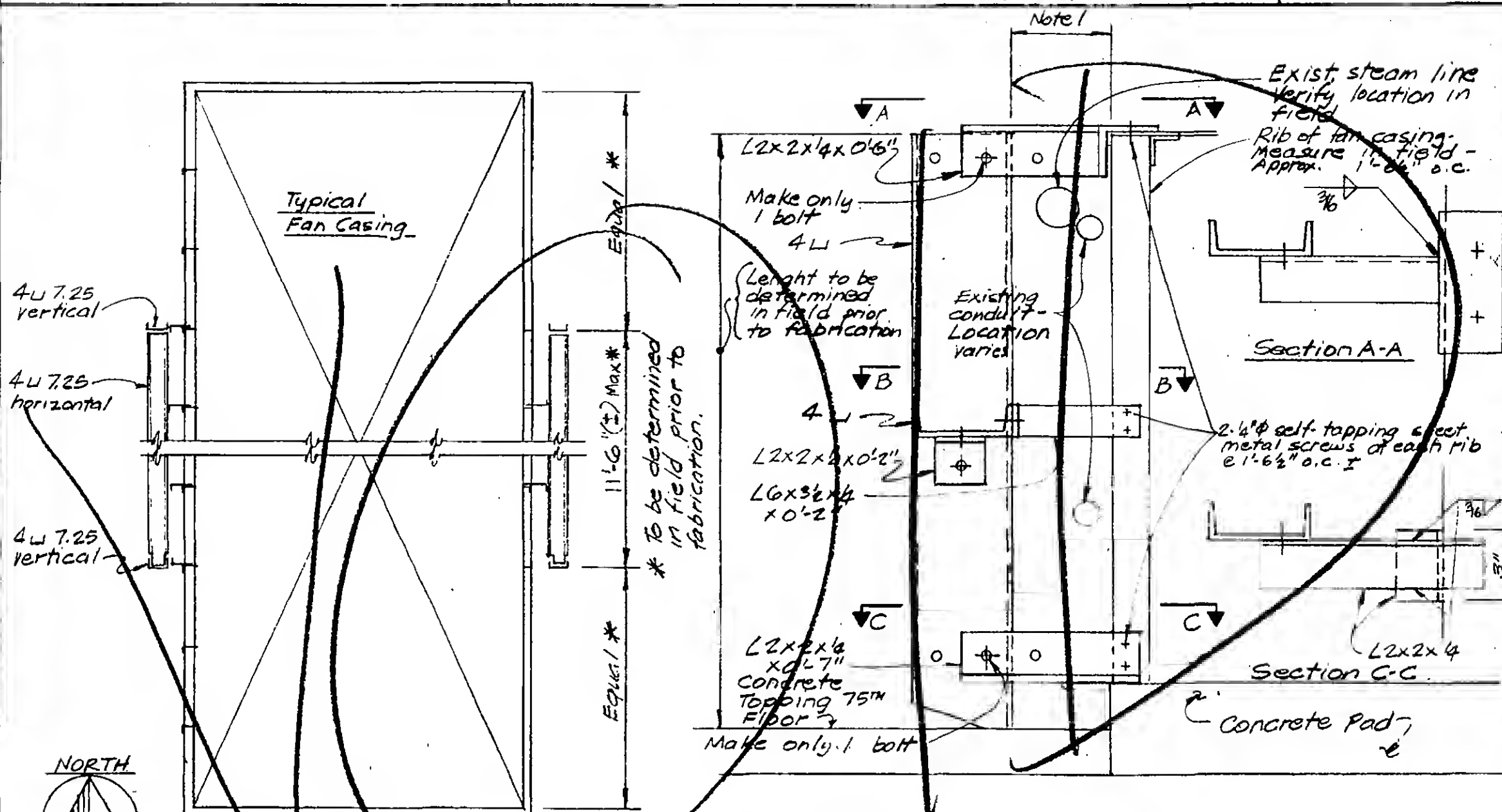
see Master Job List

& Drawing List

for information.

regarding structural
reinforcing

REVISIONS



Reinforcement frame to be constructed at following locations. (One frame each side of housing consisting of two vertical 4E7.25 members with one horizontal 4E7.25 member between.)

ACS 75-1 ACS 75-2 ACS 75-3 ACS 75-5
ACS 75-6 ACS 75-7 ACS 75-9 ACS 75-10
ACS 75-11 - 9 housings, 2 frames each
housing for a total of 18 frames *

Note - Make this dimension as small as possible to clear exist. conduit & steam line.

Note 2 All angles to be $2 \times 2 \times \frac{1}{2}$ unless shown otherwise

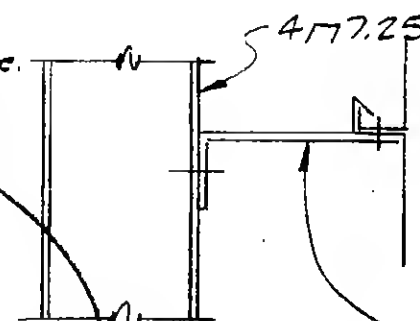
Note 3- All bolts to be $\frac{1}{2}$ " ϕ / A 325.

2-25-74

PNYA letter to
TRCC from L. Feld

Reverse angle as required -
to fit (or trim outstanding
leg)

Section B-B



DESIGNED

AR

RAW

M. A. A.

REVIEWED

17

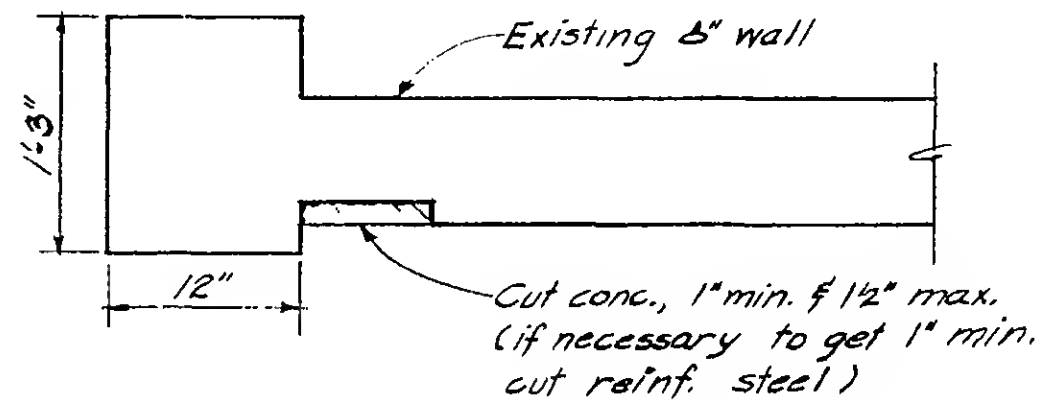
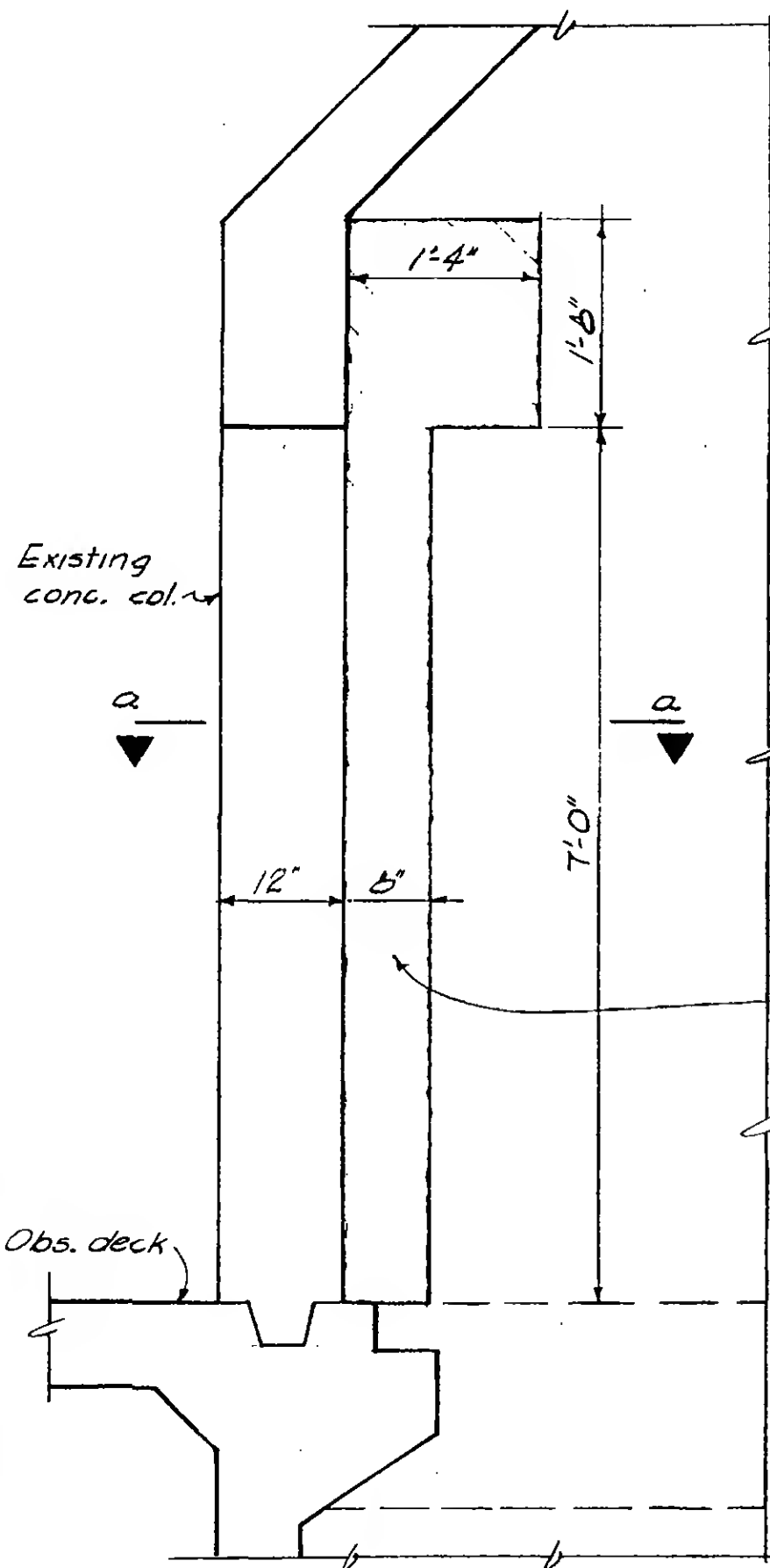
19-A-1139

PROJECT THE WORLD TRADE CENTER

TITLE REPAIR DETAIL, TOWER B, OBSERVATION DECK,
ESCALATORS B-110 & D-110, ENCLOSURE WALLS AT DOORWAY

DATE 2-27-74

REVISIONS

Section a-a

Cut in face of wall on
both sides of doorway
for escalators B-110
and D-110



DESIGNED AR

DRAWN DJB

REVIEWED JTM

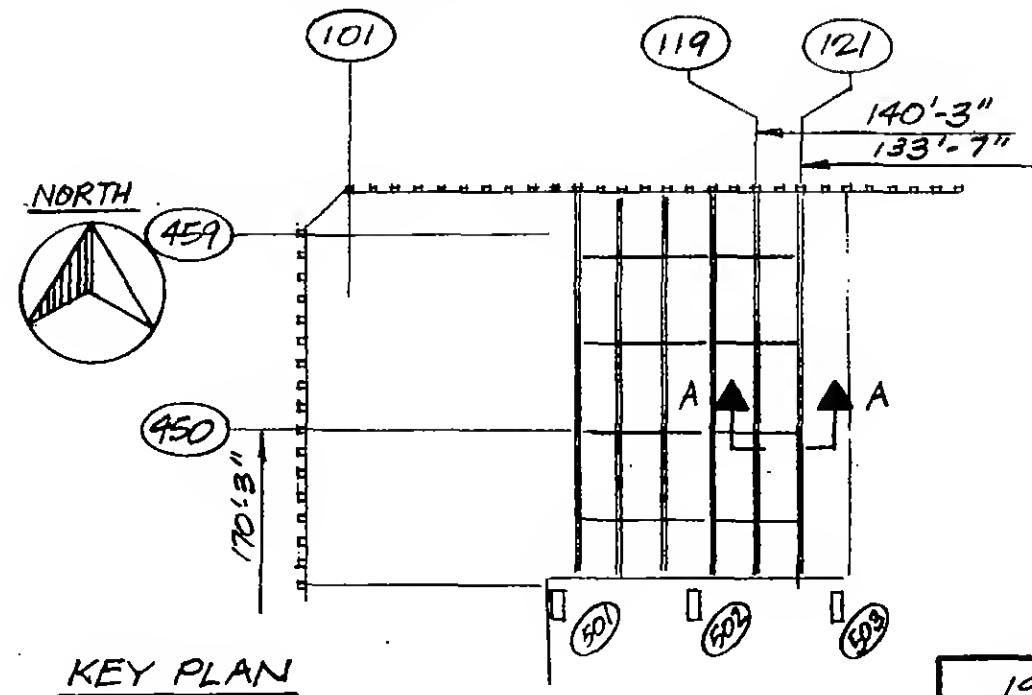
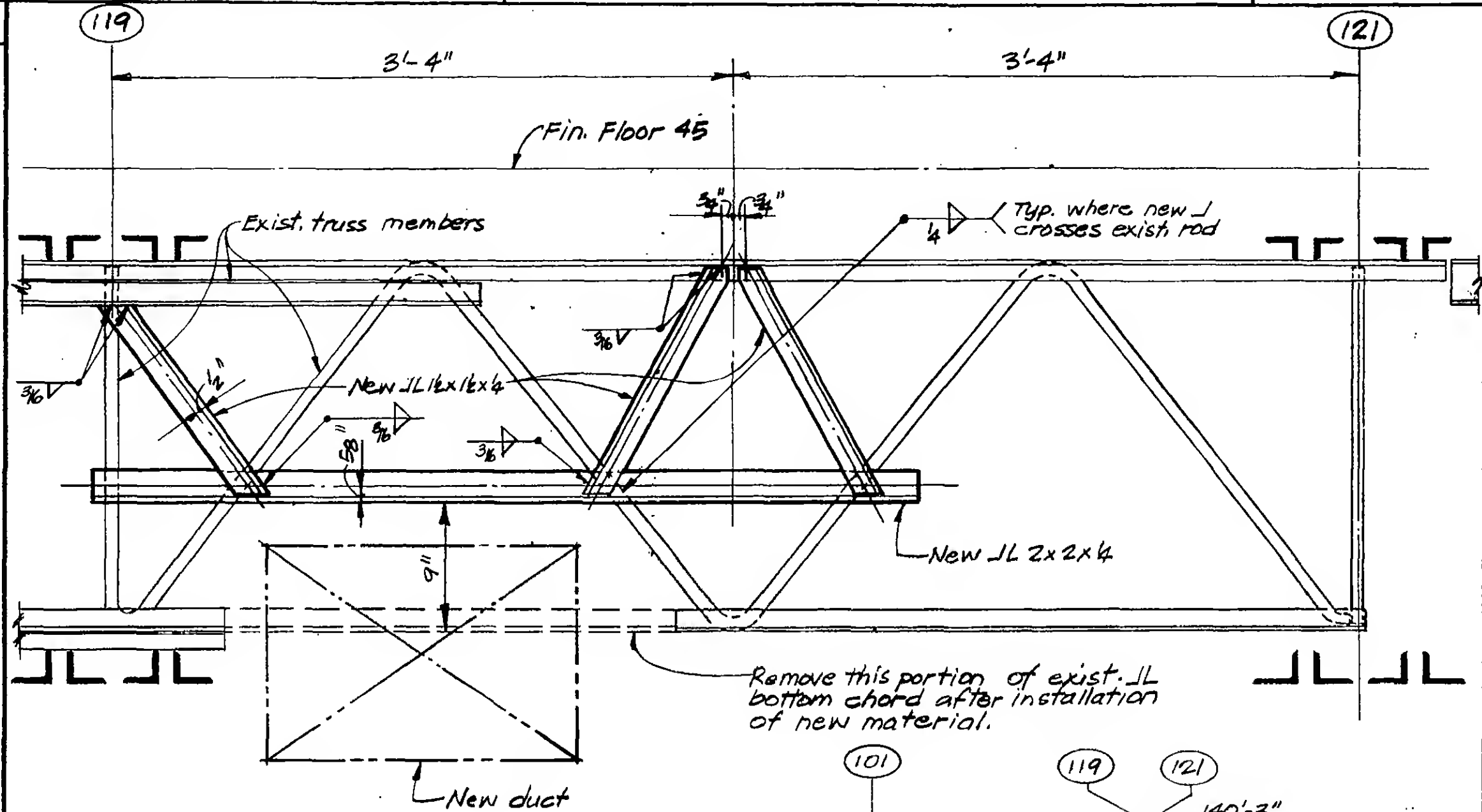
19-B-1140

PROJECT THE WORLD TRADE CENTER

TITLE TOWER A - FLOOR 45

DATE 2-28-74

REVISIONS



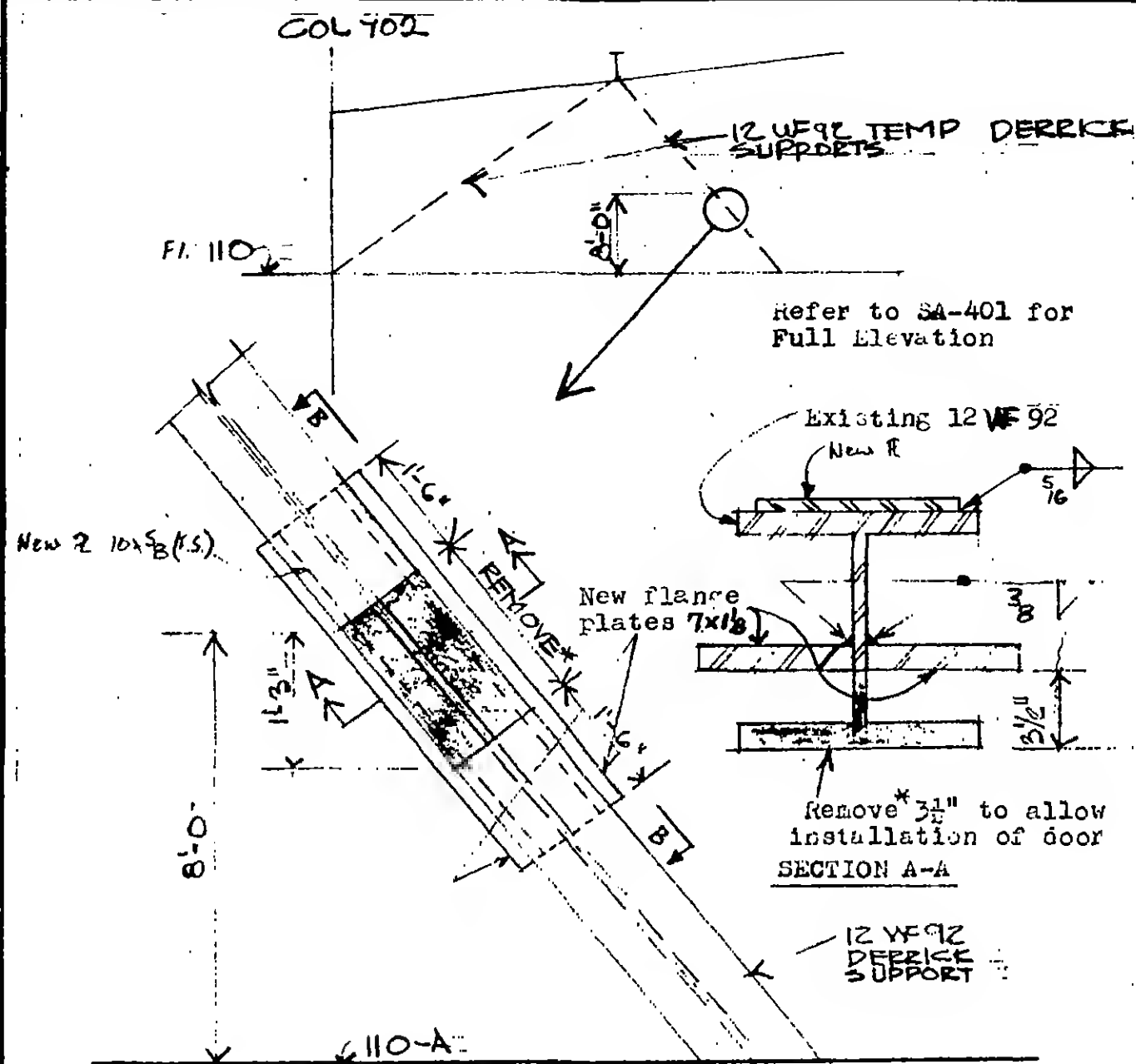
DESIGNED WAB

DRAWN M. B. L. I.

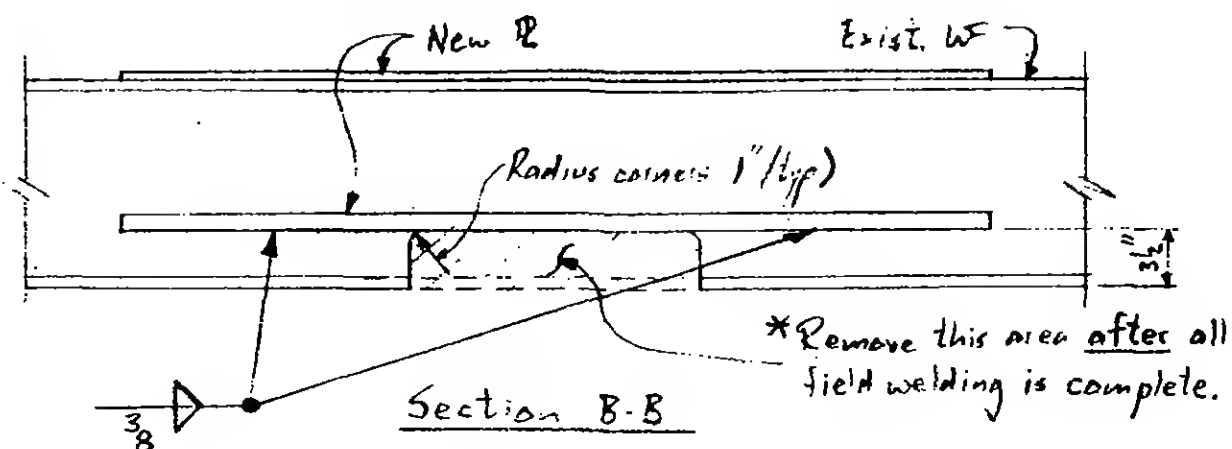
REVIEWED WAB

19-A-1141

REVISIONS



Elevation View - Looking North



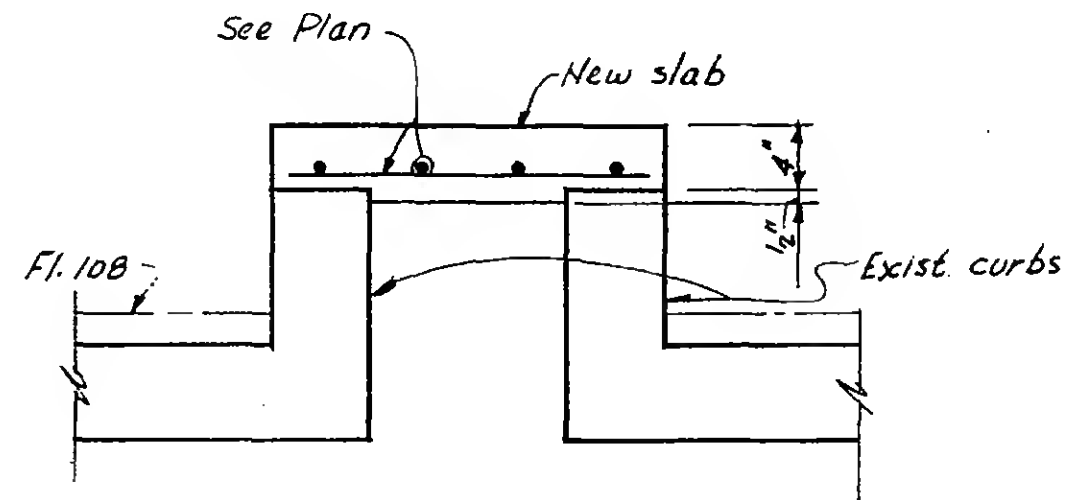
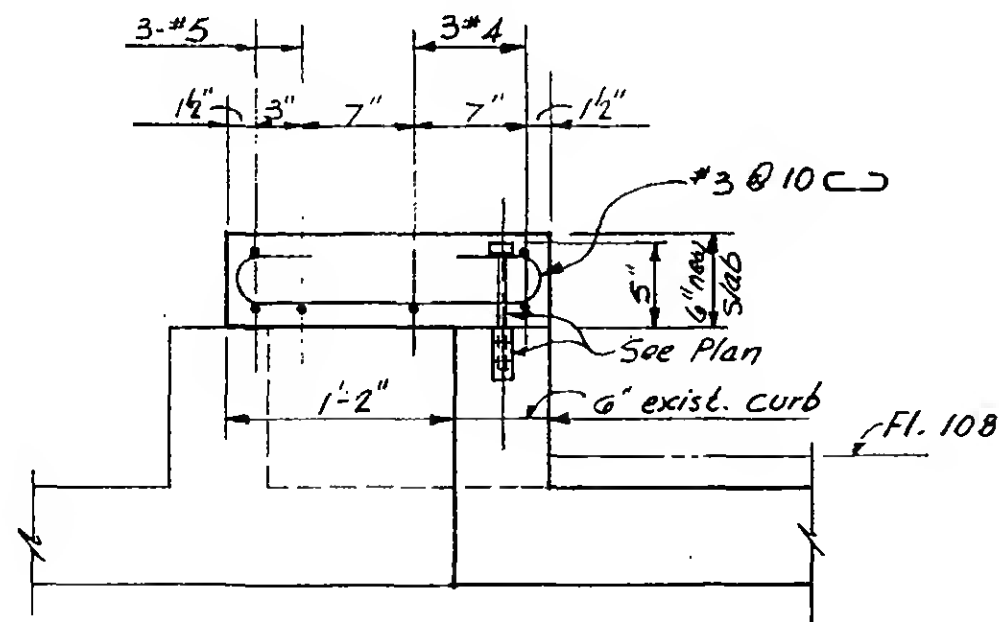
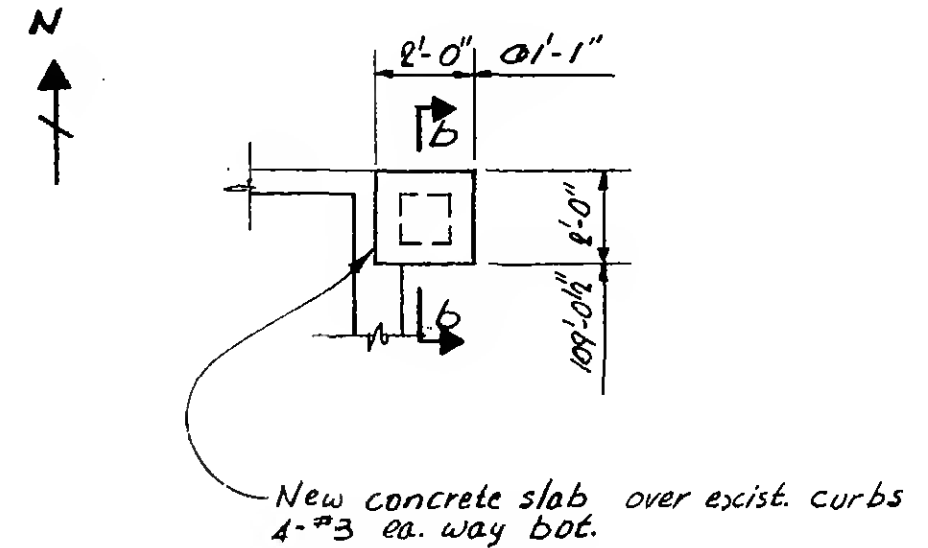
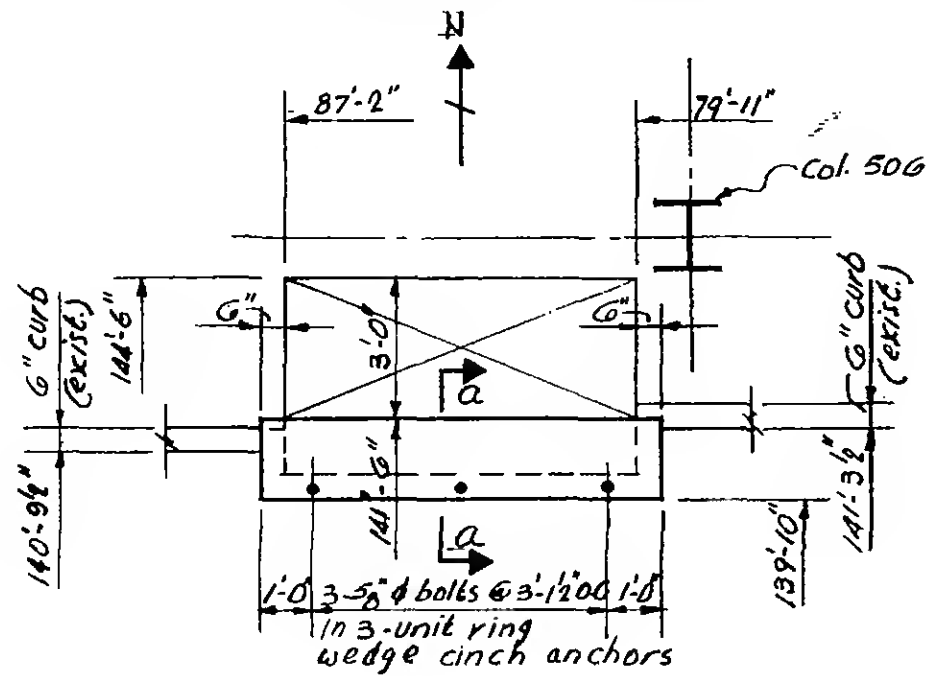
DESIGNED

DRAWN

REVIEWED

19-A-1142

REVISIONS



DESIGNED

JTM

DRAWN

DWT.

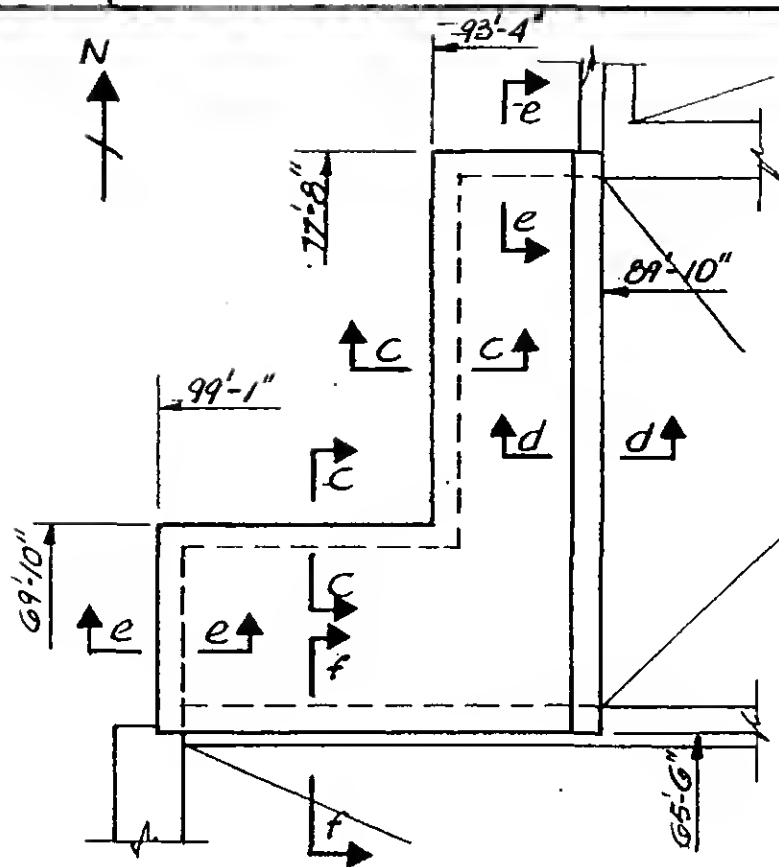
REVIEWED

a

b

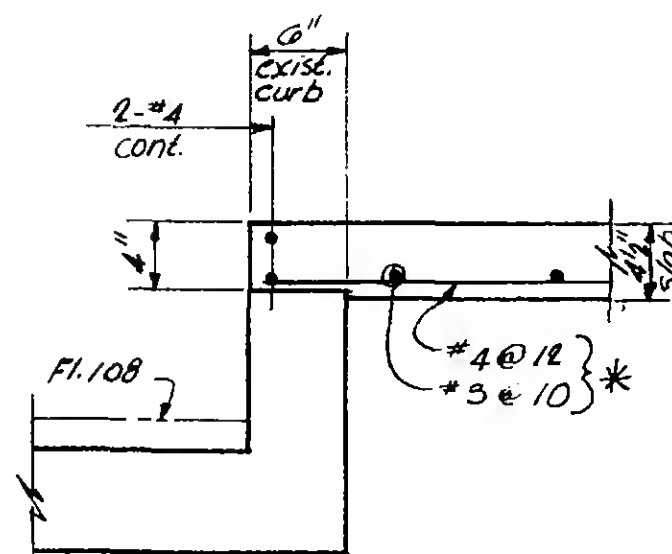
19-A-1143.1

REVISIONS



PART PLAN - TOWER A, FL. 108

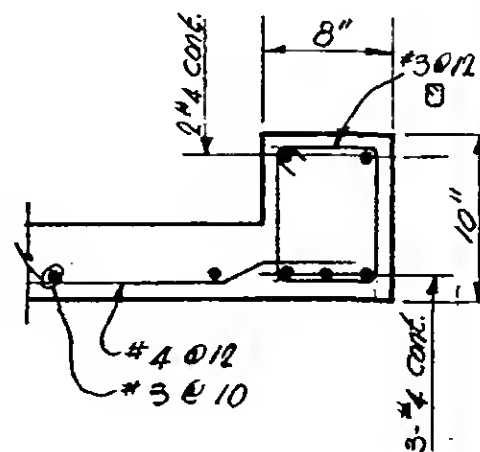
C



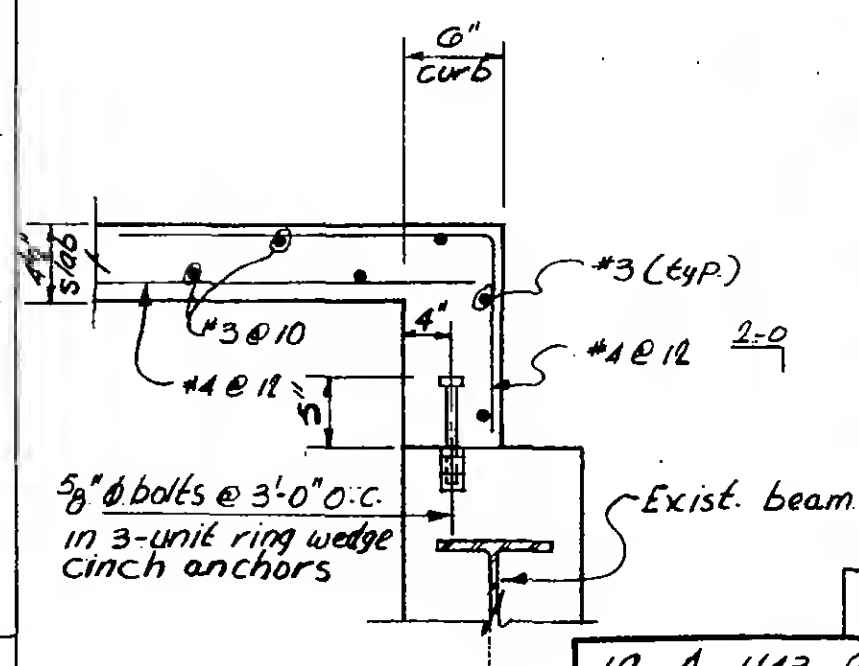
* Bot. reinf. as shown for Sect. c-c.
rotate reinf. 90° horiz. for
Sect. e-e.

C

e



d



f

19-A-1143.2



DESIGNED

JTM.

DRAWN

DWT.

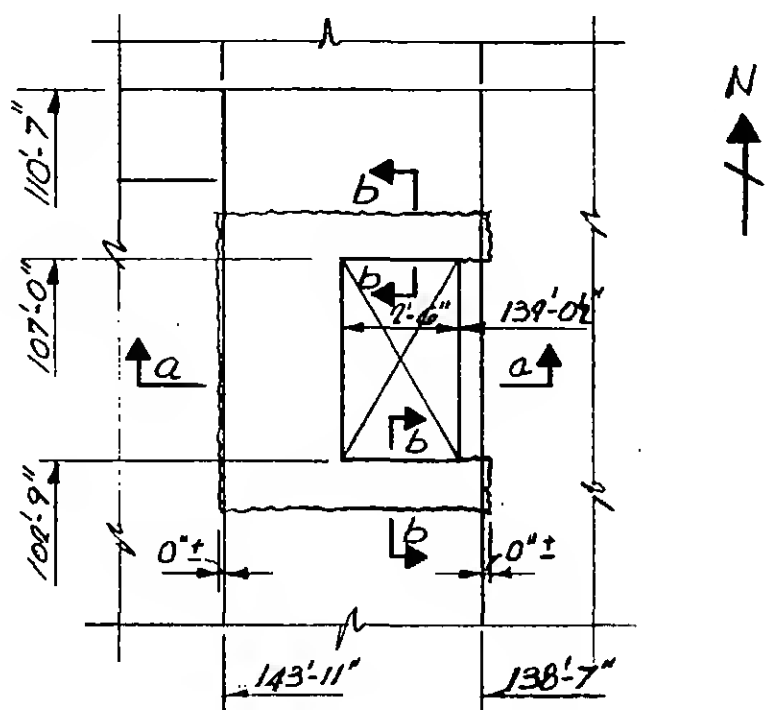
REVIEWED

PROJECT THE WORLD TRADE CENTER

TITLE TOWER A, FLOOR 107, OPENING FOR LAUNDRY CHUTE

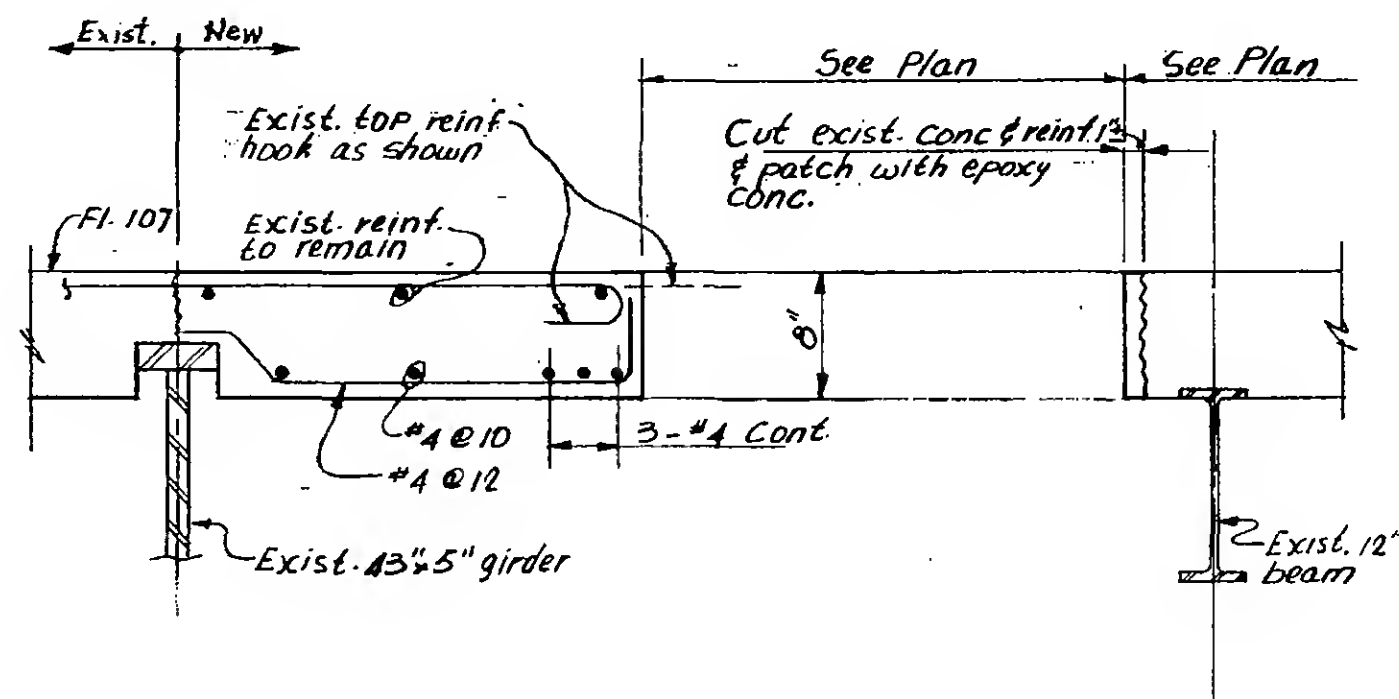
DATE 12-10-74

REVISIONS

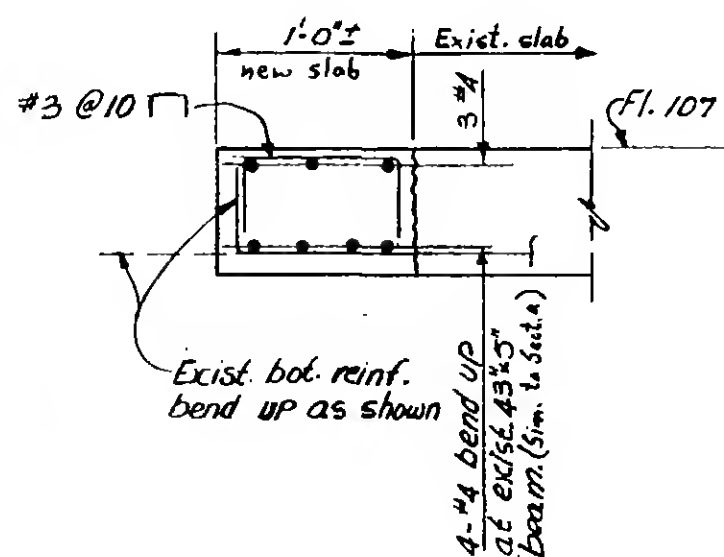


Part Plan- Tower-A, Floor 107

A



a



b



DESIGNED

J.T.M.

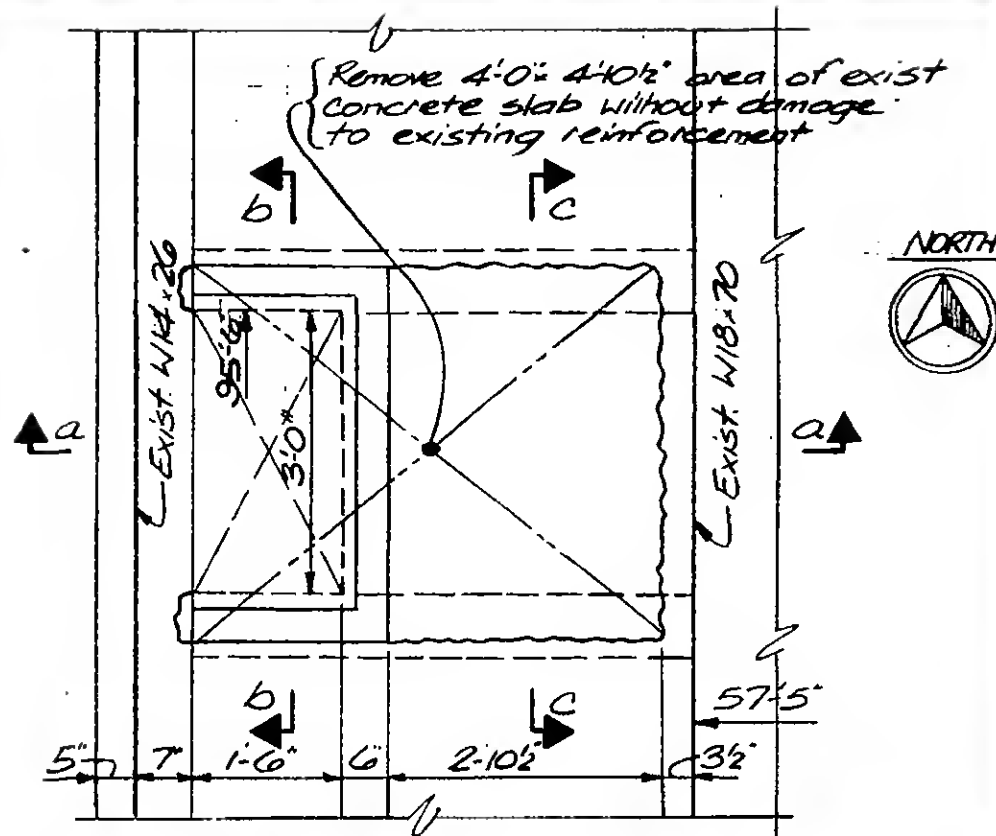
DRAWN

D.W.T.

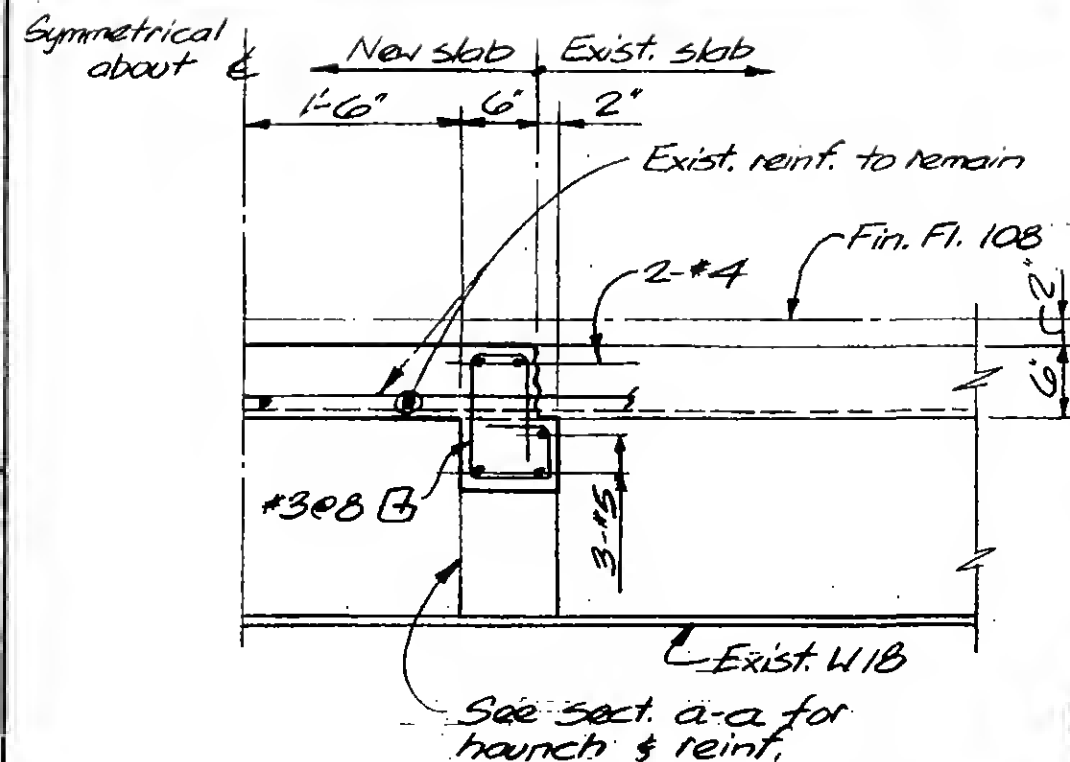
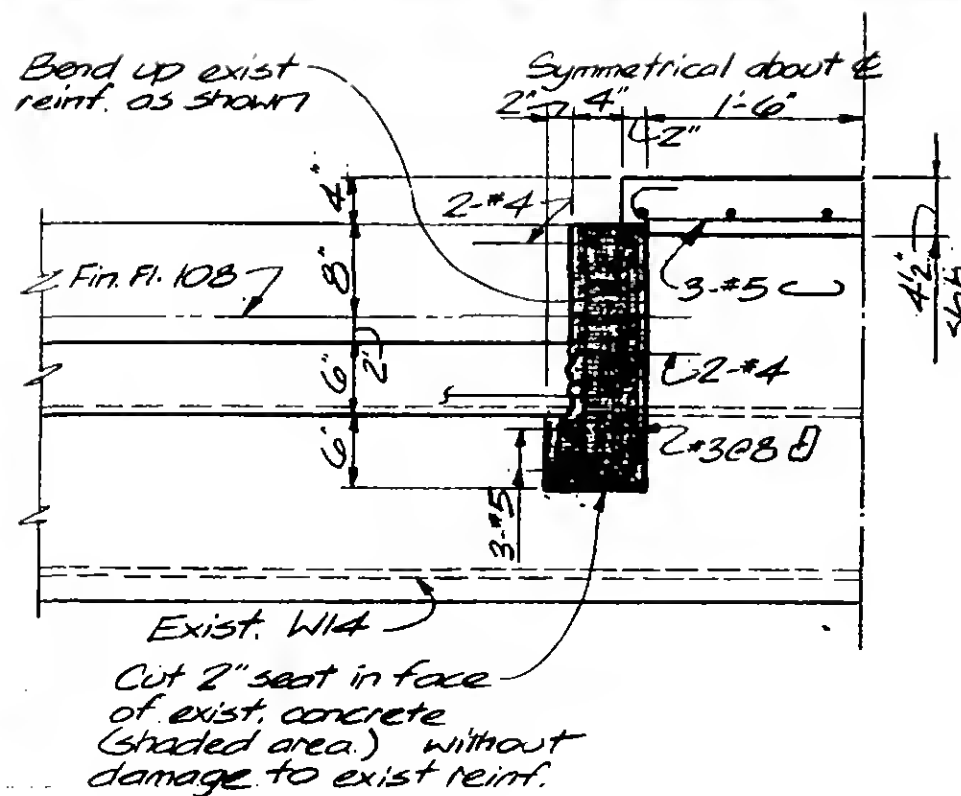
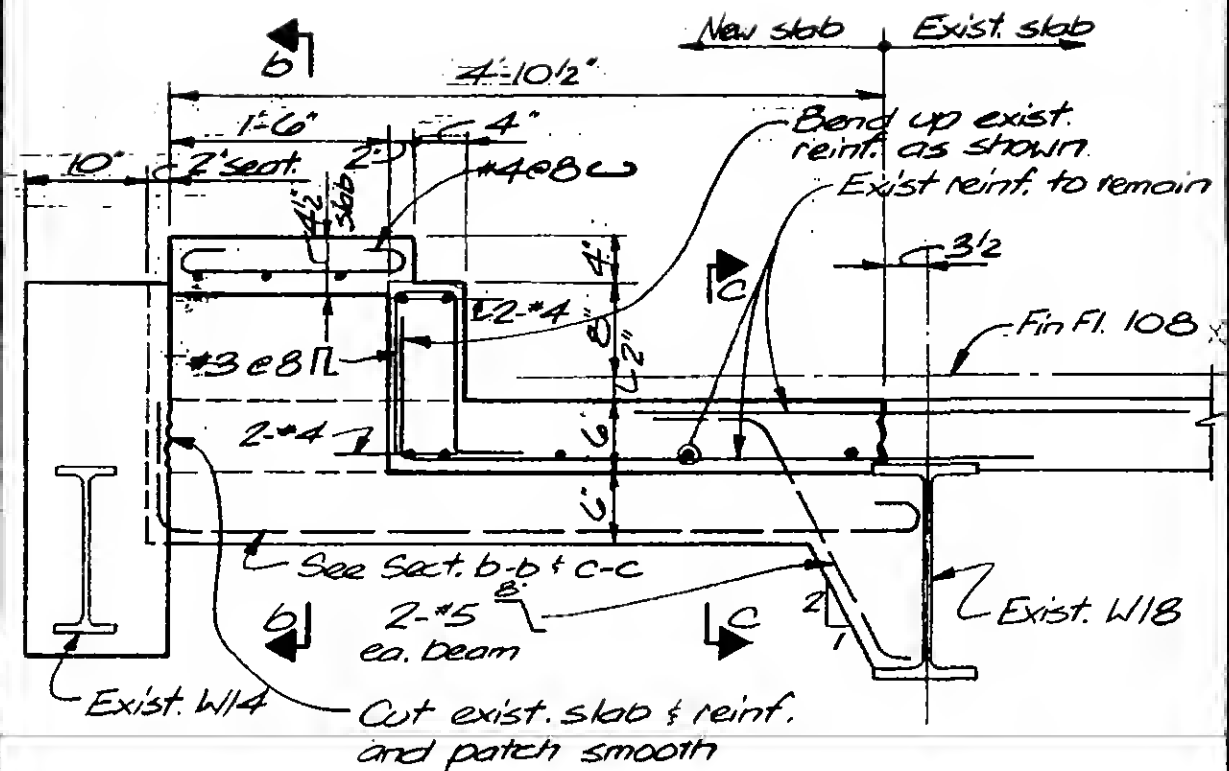
REVIEWED

19-A-1144

REVISIONS



Part Plan, Tower A, Fl. 108 -
Core Area near Col. 806



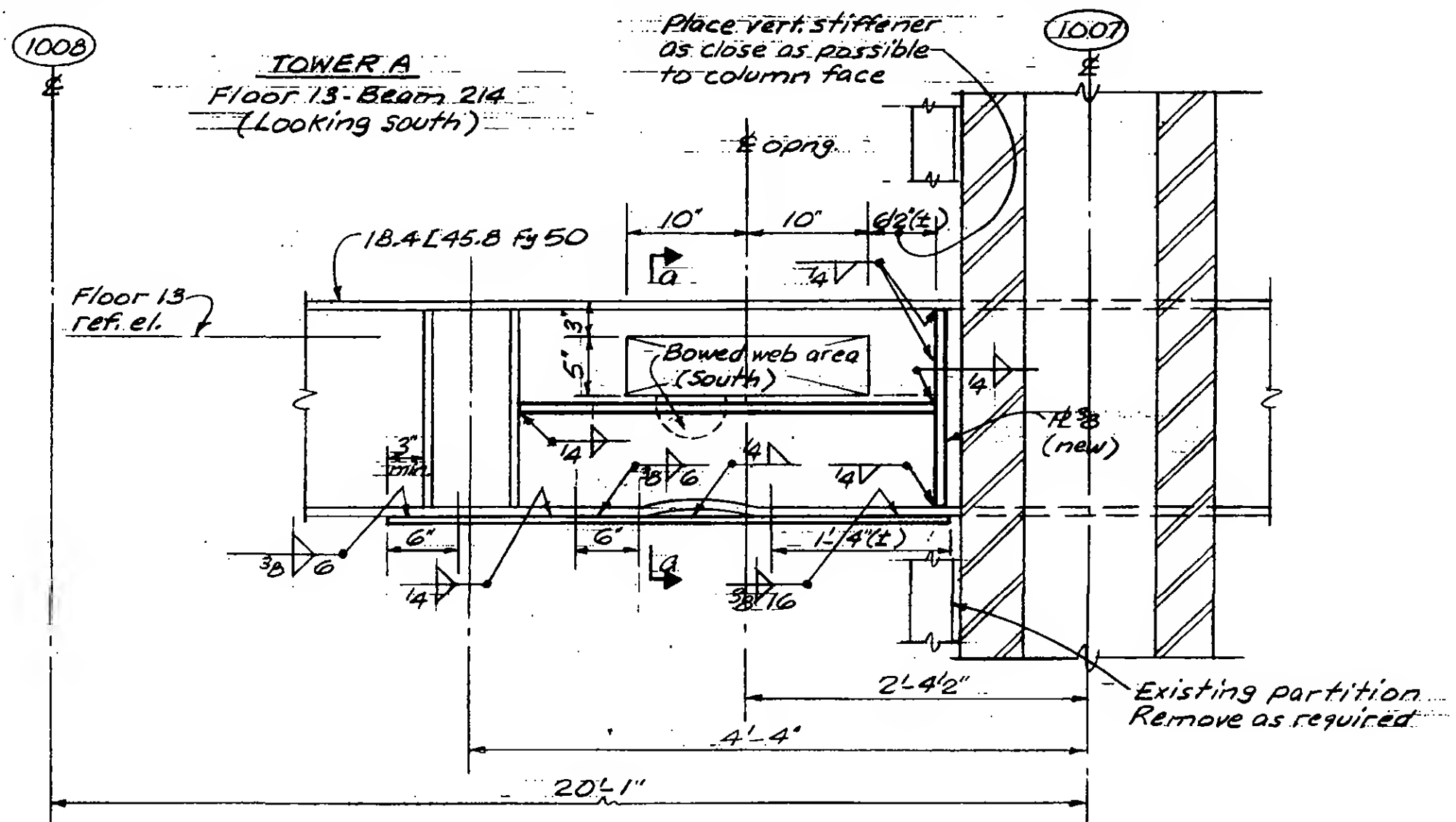
DESIGNED *JTM*

DRAWN *JB*

REVIEWED *WAB*

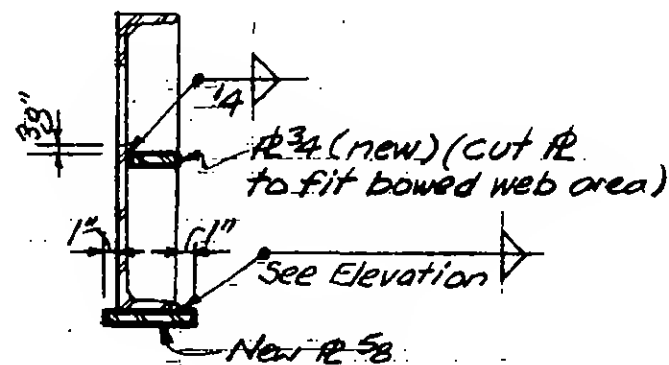
19-A-1145

REVISIONS



Procedure

1. Maintain existing shore
2. Weld vertical web R 38
3. Weld horizontal web R 34
4. Remove existing shore
5. Weld horizontal bottom R 58



Note: All new #s shown are Fy 50.



DESIGNED

CD

DRAWN

ALA

REVIEWED

VIEWED *WAB*

Section a-a

19-A-7146

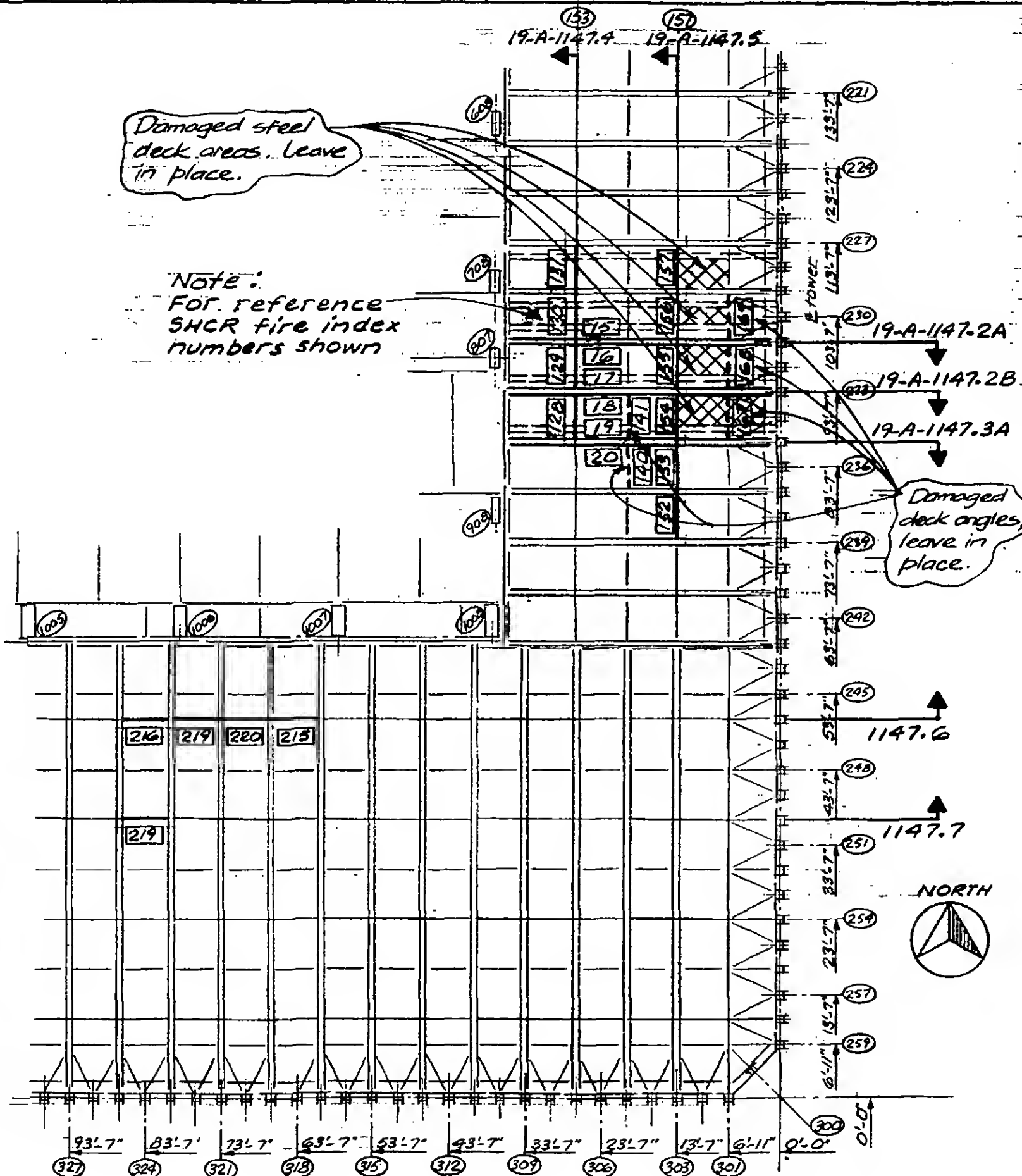
PROJECT THE WORLD TRADE CENTER

TITLE FEB. FIRE - FLOOR 12 - TOWER A - REPAIR PLAN

DATE 2-24-75

REVISIONS

3-20-75



Notes:

1. All new material shall be ASTM-A36 except for top chord repairs shall be Fy 50.
2. All new weldings shall be accomplished use E7018 low hydrogen electrodes.
3. Repair sequence shall be as follows:
 - A. Shore area of repairs.
 - B. Remove existing damping units where indicated.
 - C. Make repairs.
4. Fireproof entire truss including top chord full length.



DESIGNED

DRAWN
ALF

REVIEWED

19-A-1147.1

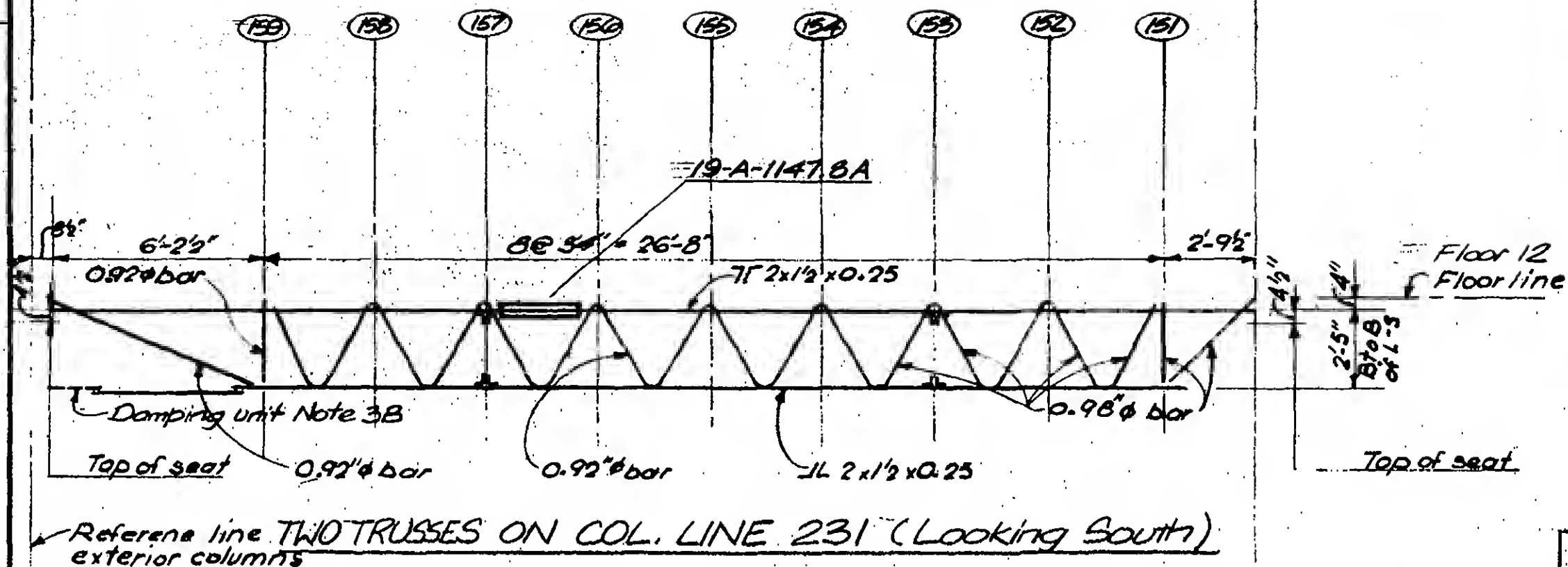
PROJECT THE WORLD TRADE CENTER

TITLE FLOOR TRUSS C32T5-FEB. FIRE TRUSS REPAIR

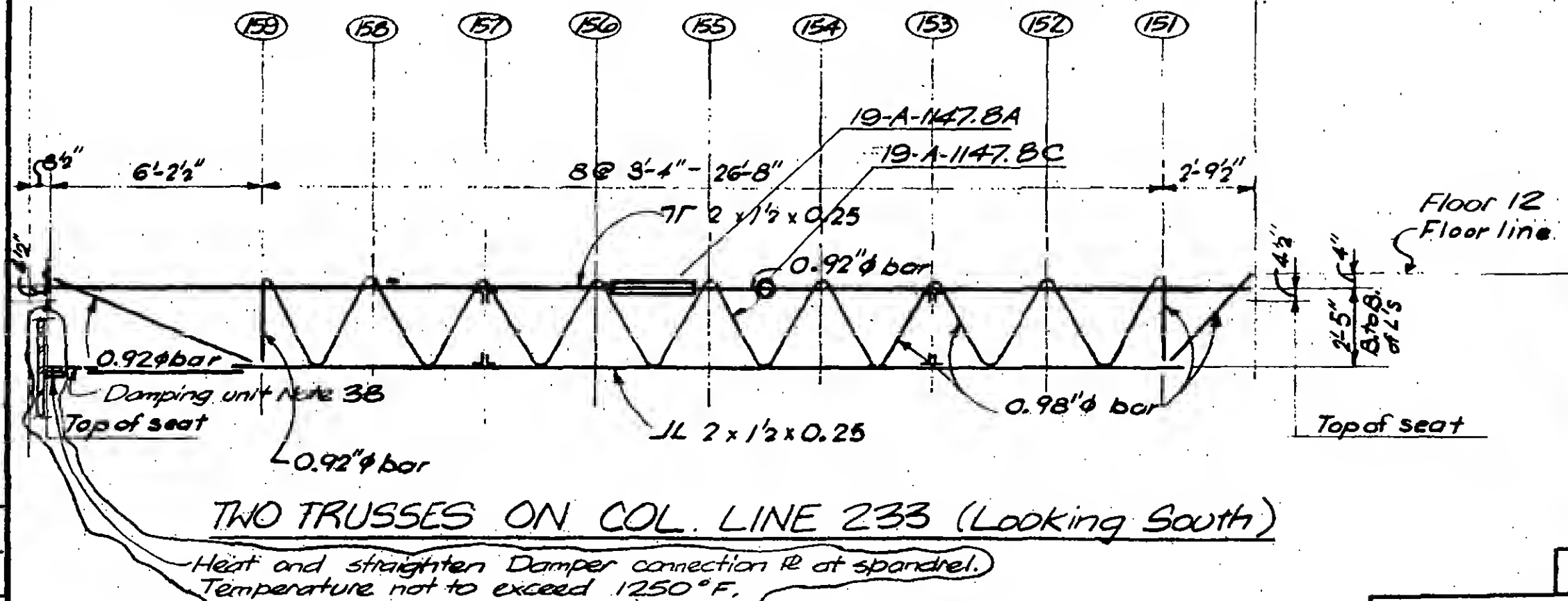
DATE 2-24-75

REVISIONS

3-20-75



A



B

19-A-1147.2



DESIGNED

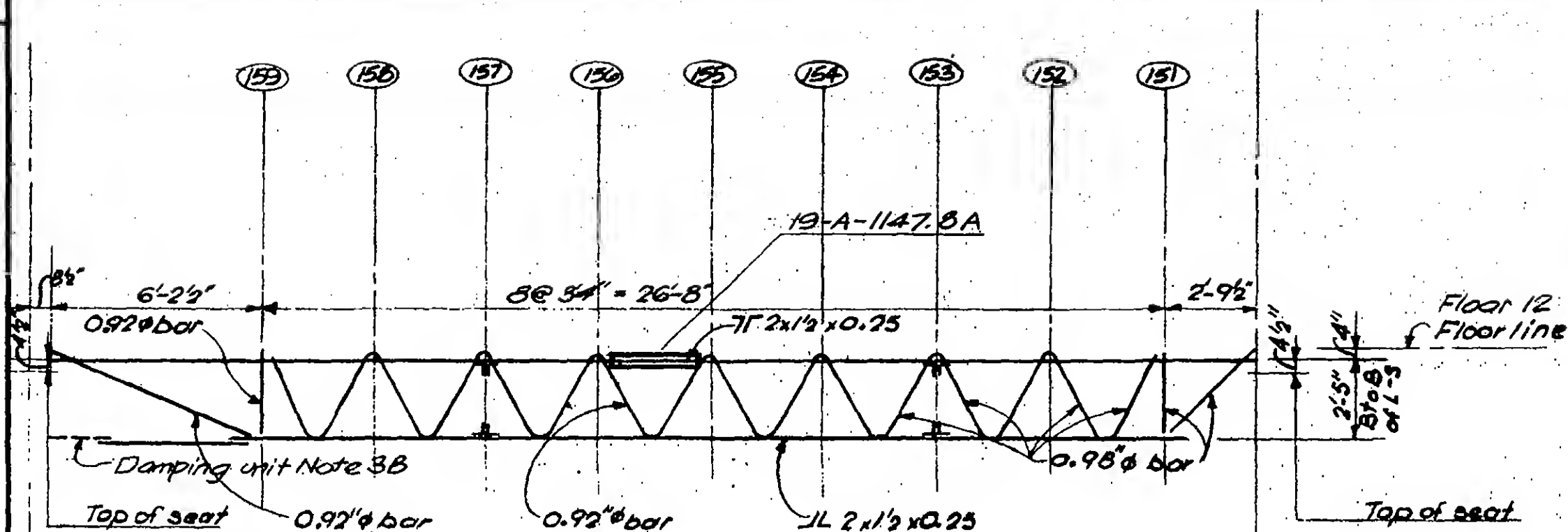
DRAWN

JB

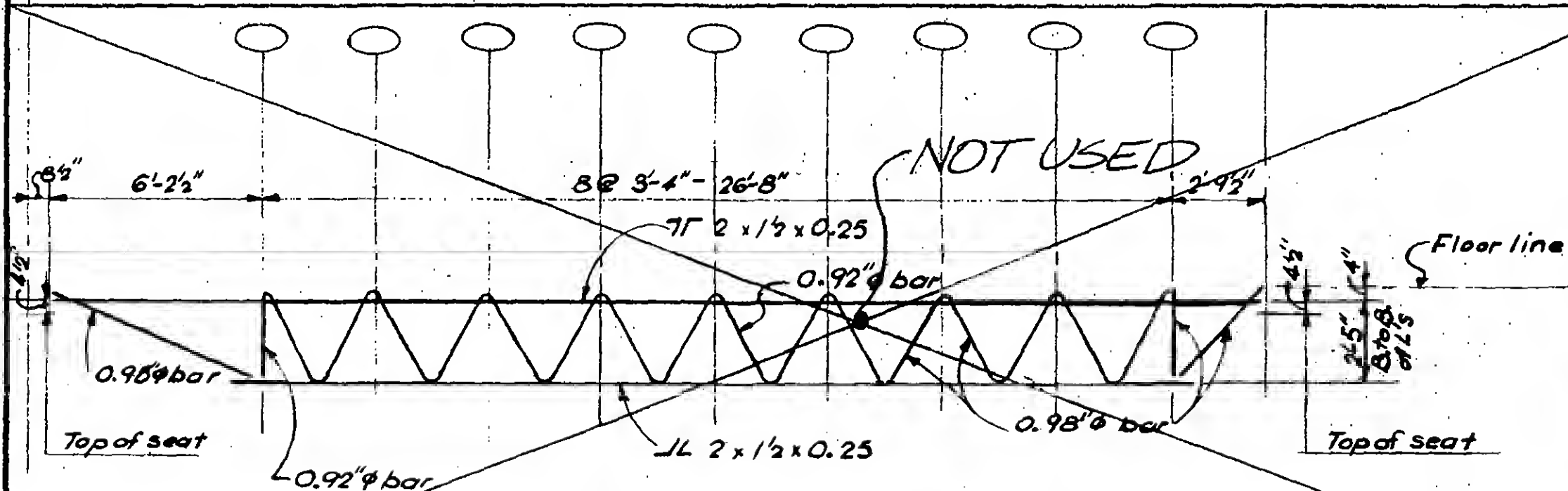
REVIEWED

WAB

REVISIONS



Reference line TWO TRUSSES ON COL. LINE 235 (Looking South)
exterior columns



DE SLIMME D

ORAWIN

REVIEWER

19-A-1147.3

Structural & Civil Engineers

PROJECT

THE WORLD TRADE CENTER

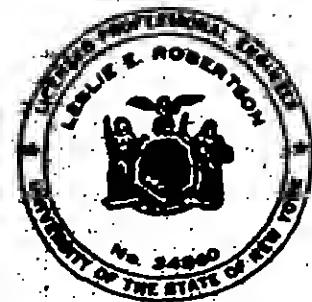
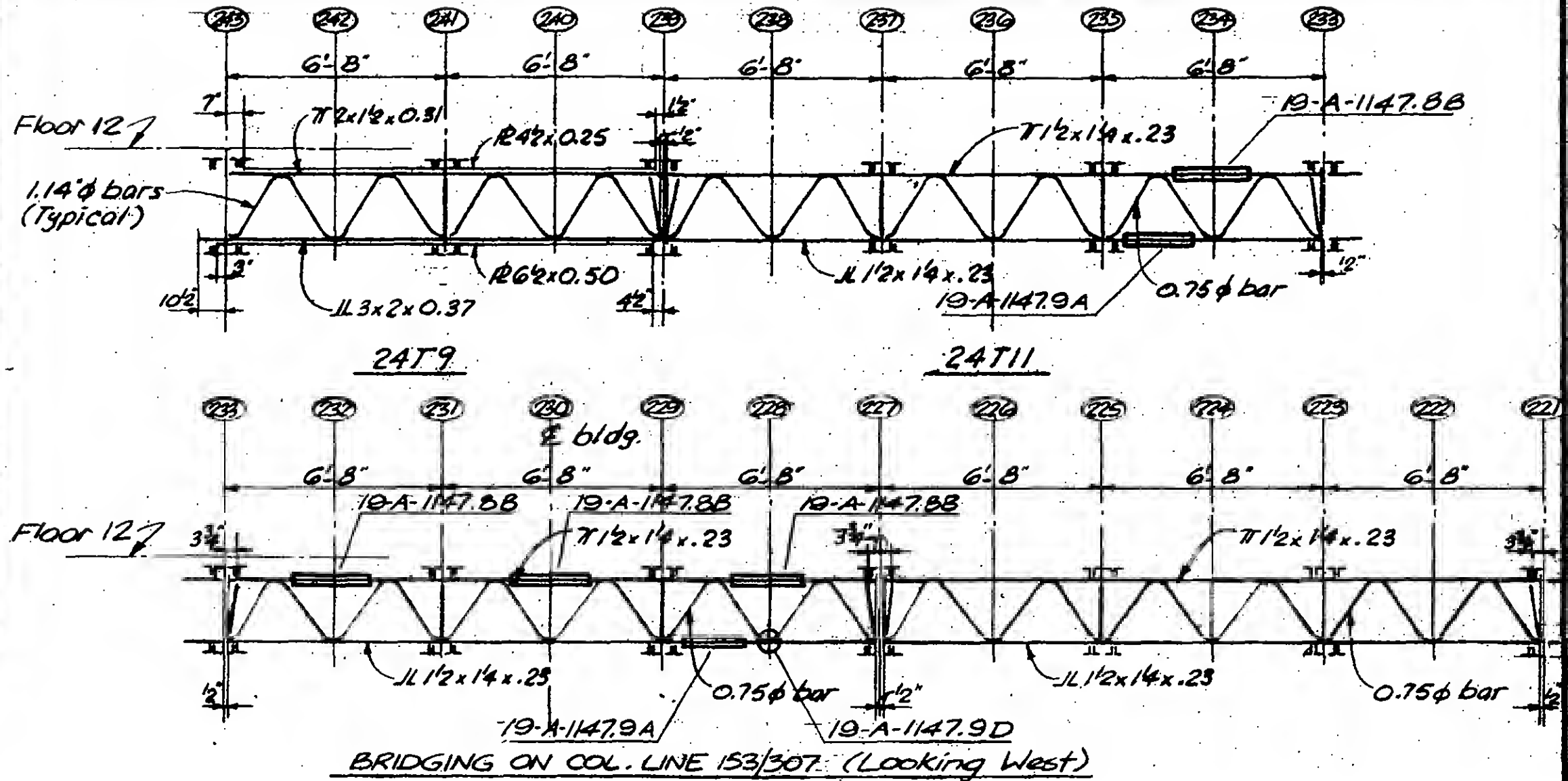
TITLE

FLOOR TRUSS-FEB. FIRE BRIDGING REPAIR

DATE _____

2-24-75

REVISIONS



Wageningen

SECRET

REVIEW

19-A-1147, #

[illegible]

DECLASSIFIED

SHAWN
A. FRANKU

REVIEWED

19-A-1147.5

SKILLING, HELLE, CHRISTIANSEN, ROBERTSON

Structural & Civil Engineers

PROJECT

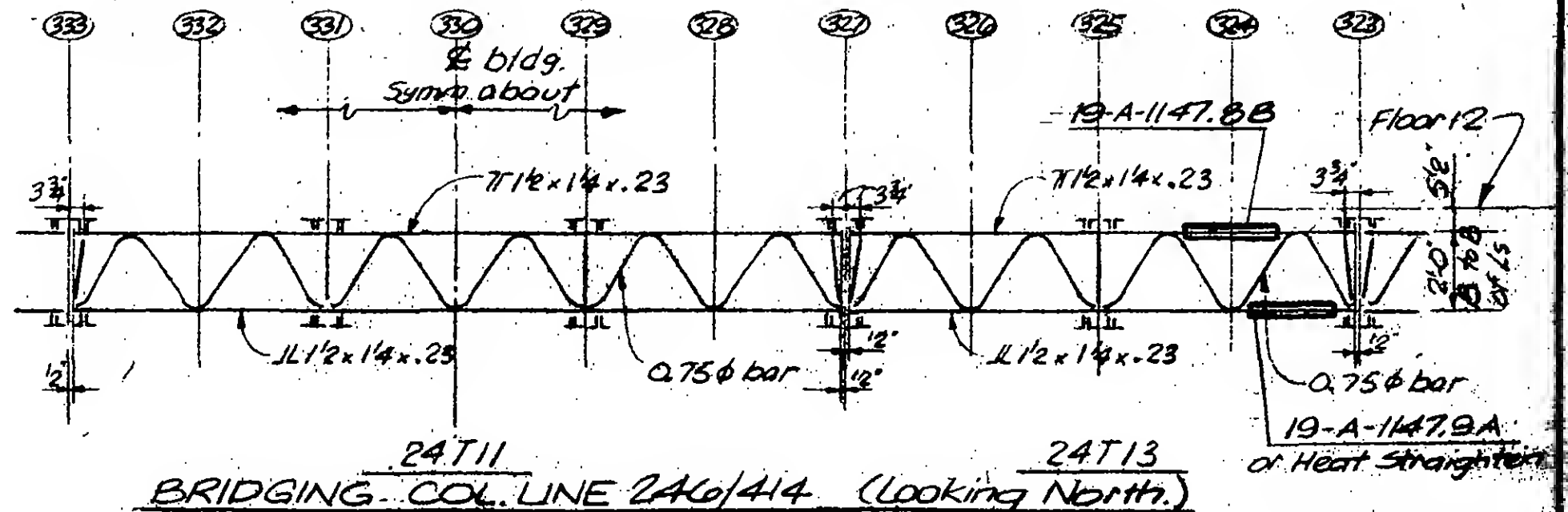
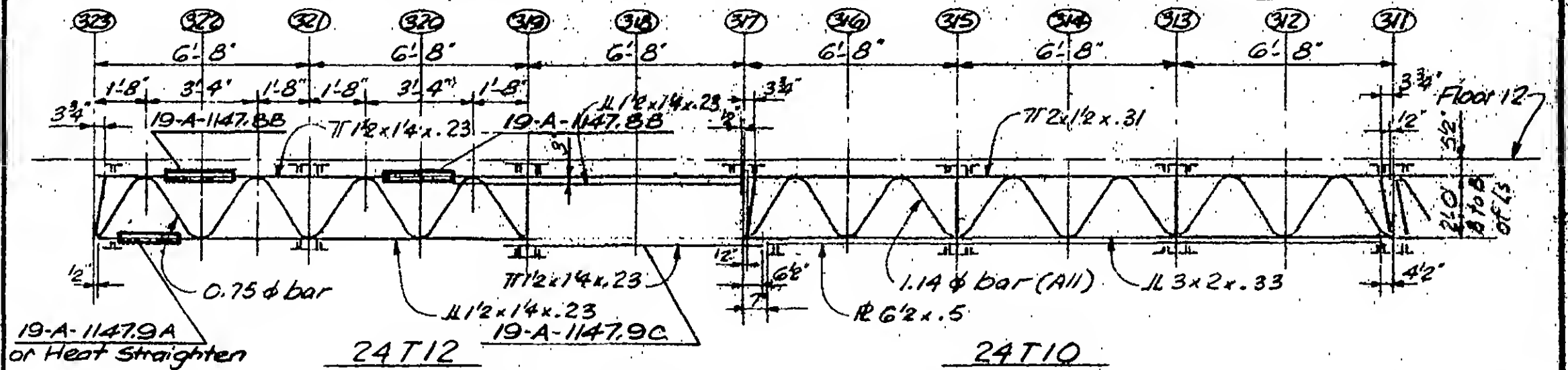
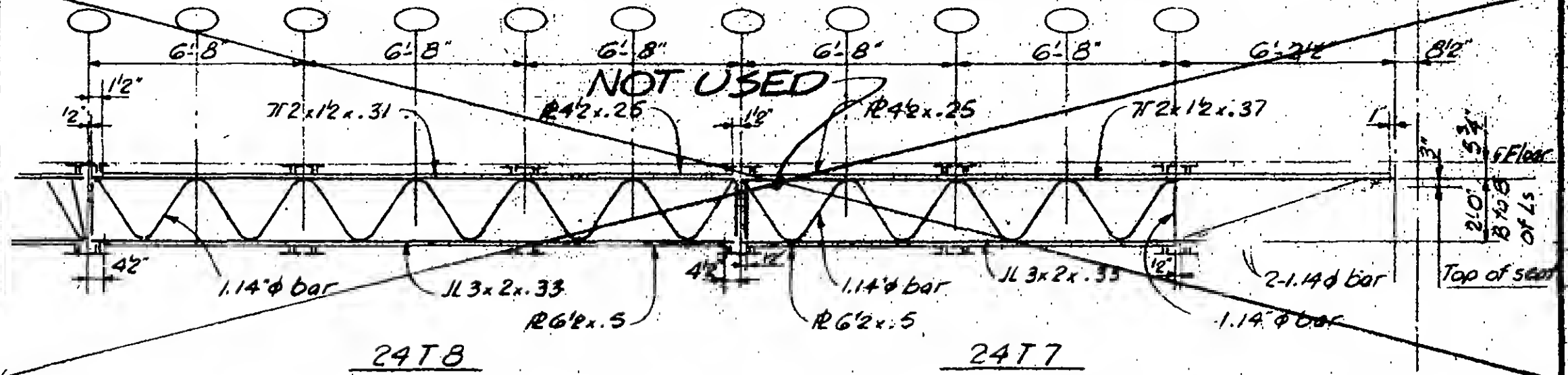
TITLE

FLOOR TRUSS - FEB. FIRE BRIDGING REPAIR

DATE

2-24-75

REVISIONS



19-A-1147.6



DESIGNED

DRAWN
A. FRANQUI

REVIEWED

W. J. P.

PROJECT

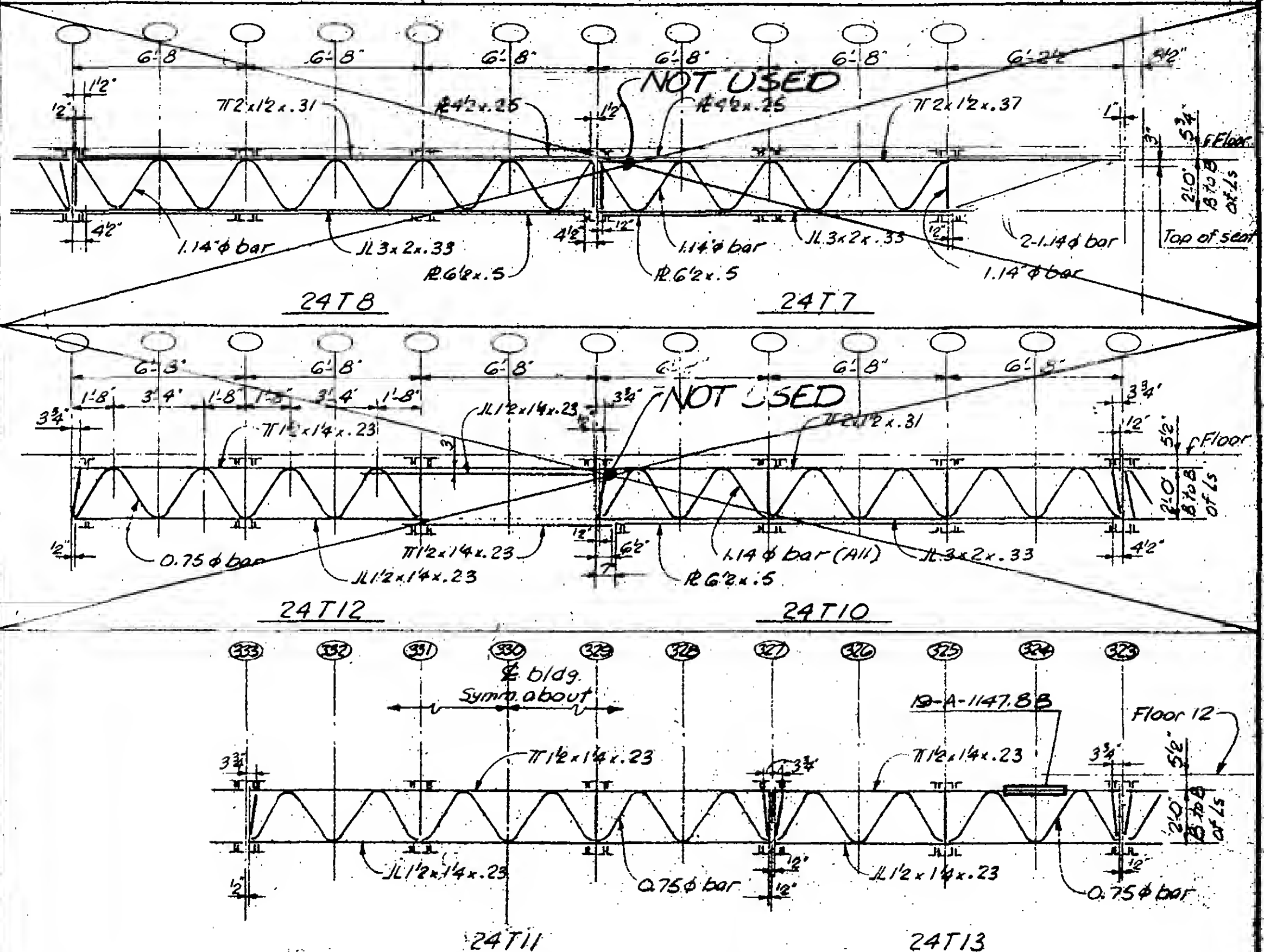
TITLE

FLOOR TRUSS - FEB. FIRE BRIDGING REPAIR

DATE _____

2-24-75

REVISIONS



DESMOND

DRAWN
A. FRANQUI

REVIEWED

BRIDGING COL. LINE 250/410 (Looking North)

19-A-1147.7

PROJECT

THE WORLD TRADE CENTER

TITLE

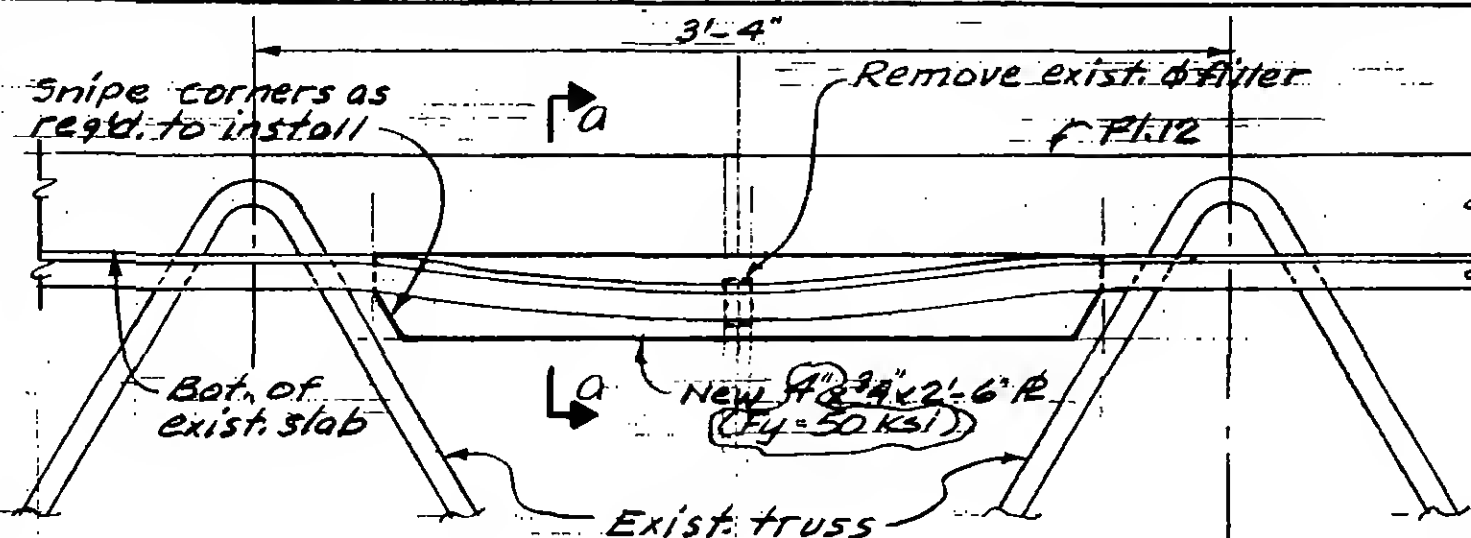
FEB. FIRE-FLOOR 12-TOWER A-REPAIR DETAILS

DATE

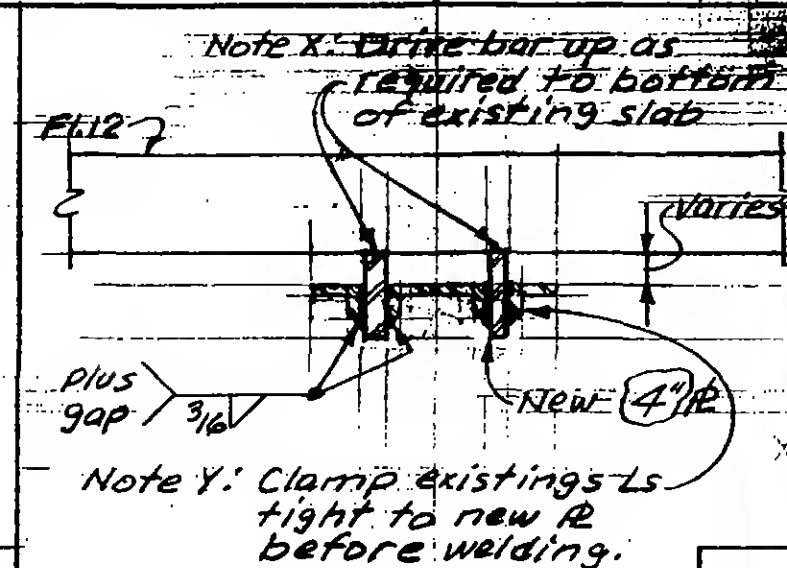
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REVISIONS

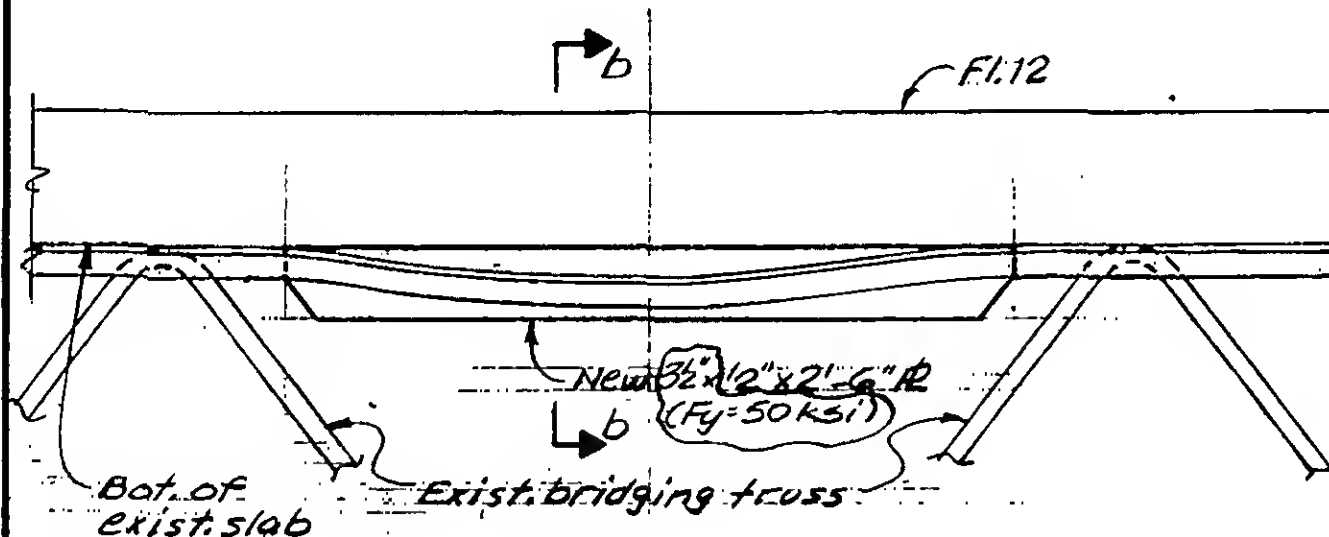
3-20-75



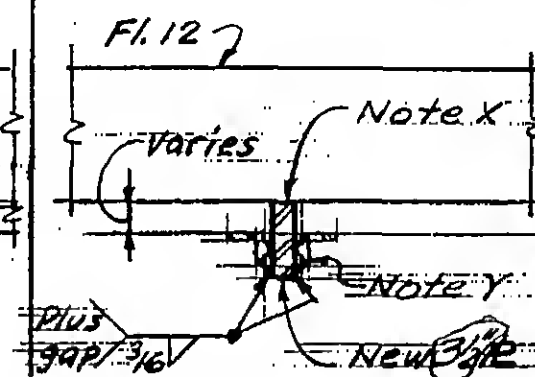
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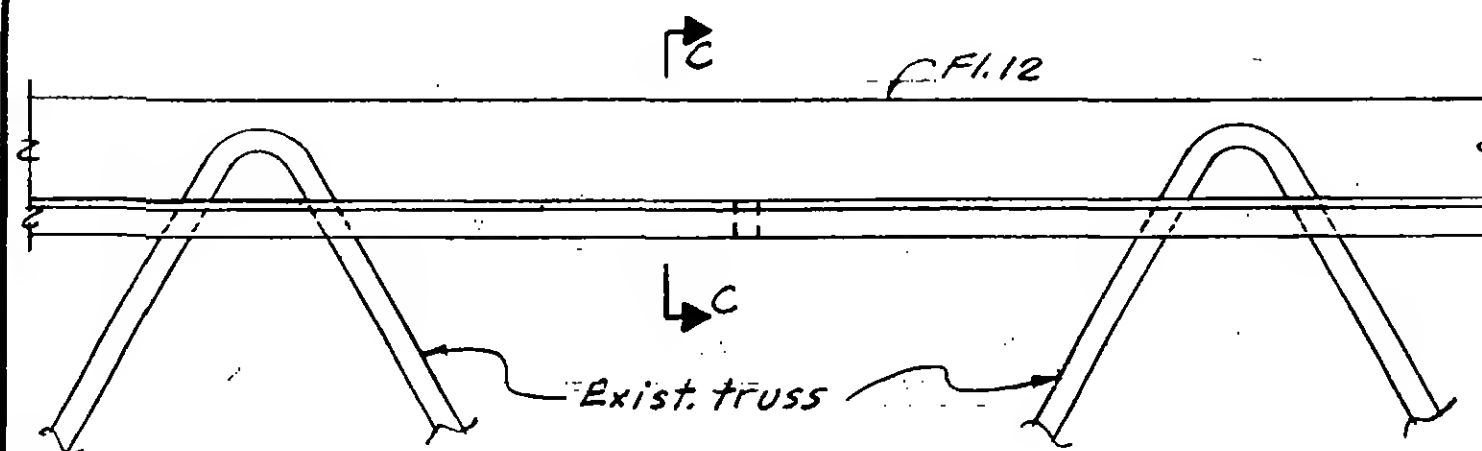
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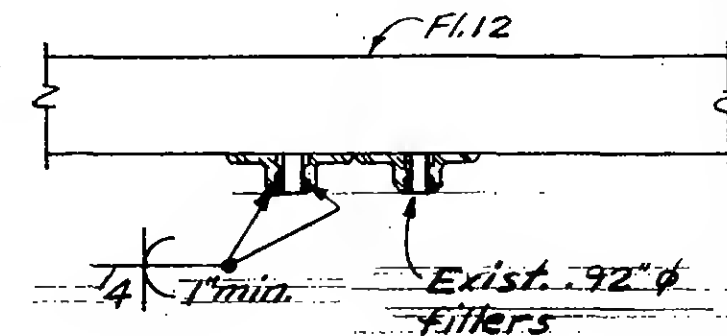
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b



C



c



DESIGNED

DRAWN ALF

REVIEWED

wab

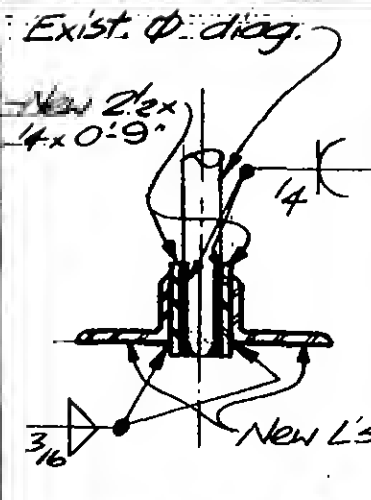
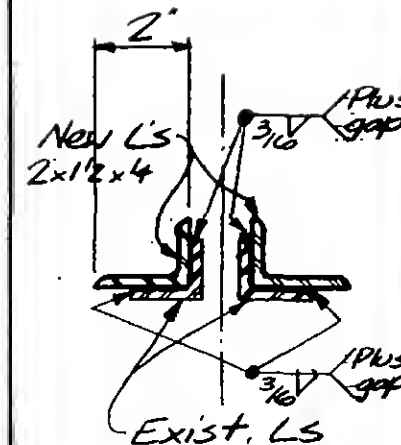
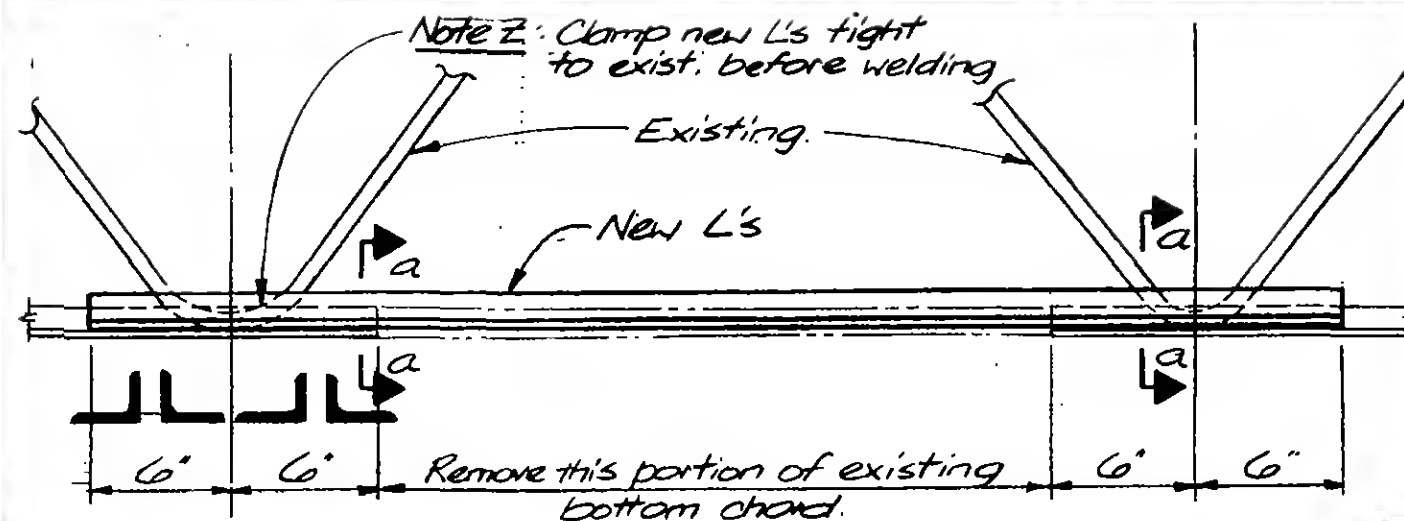
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PROJECT THE WORLD TRADE CENTER

TITLE FEB. FIRE - FLOOR 12 - TOWER A - REPAIR DETAILS

DATE 2-24-75

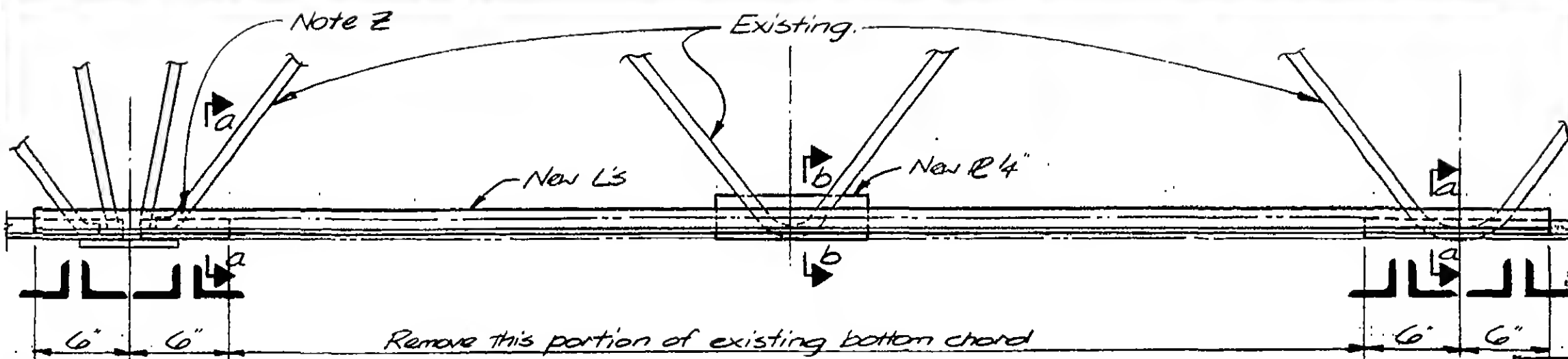
REVISIONS



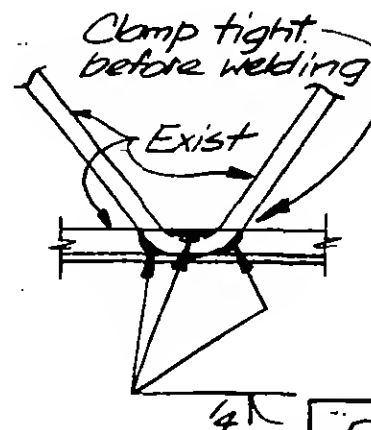
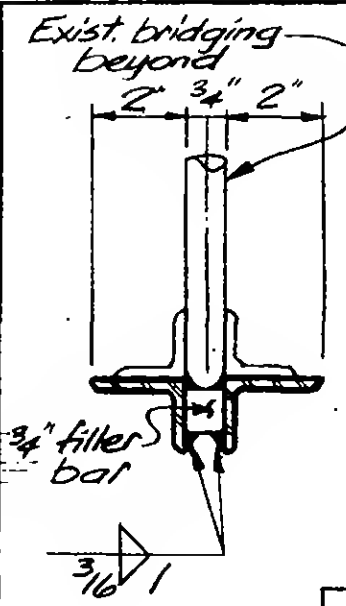
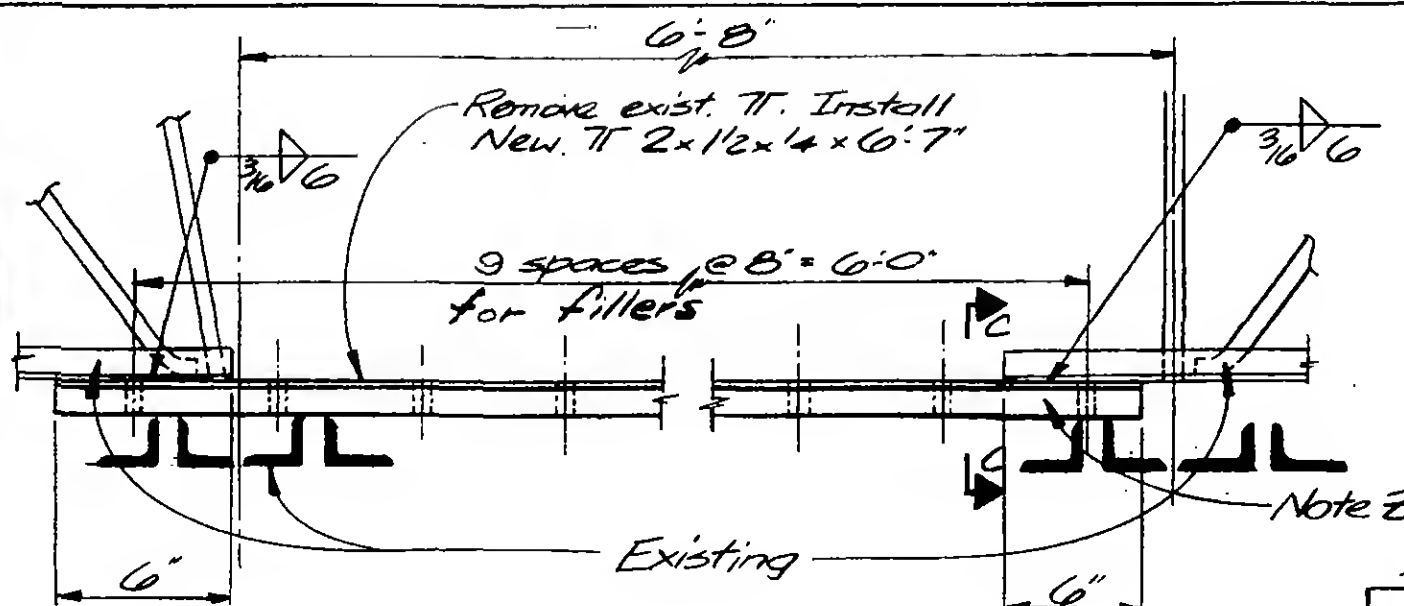
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B



C

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19-A-1147.9



DESIGNED

DRAWN

REVIEWED

JB

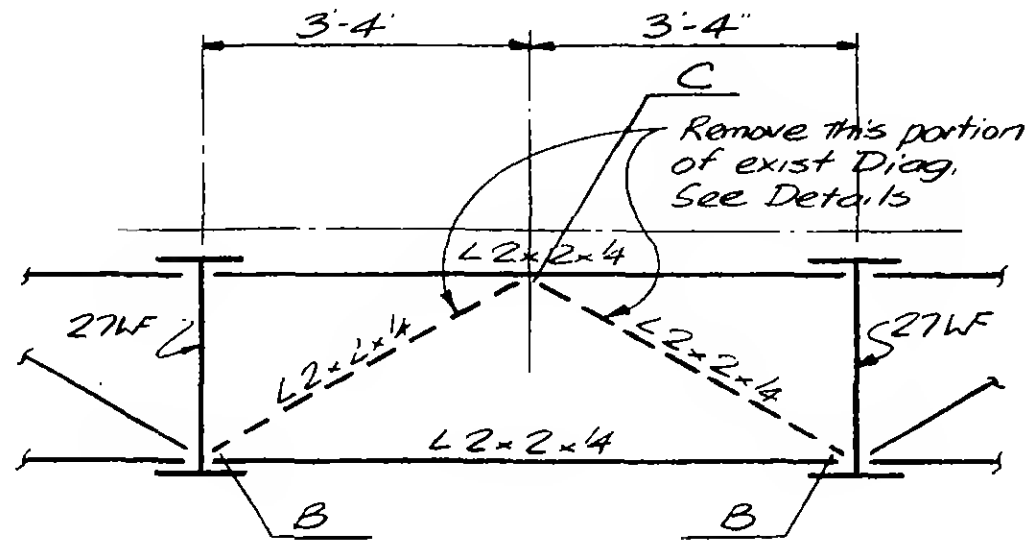
2/28/75

PROJECT THE WORLD TRADE CENTER

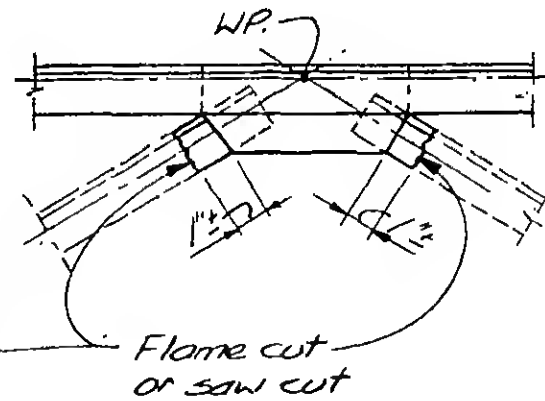
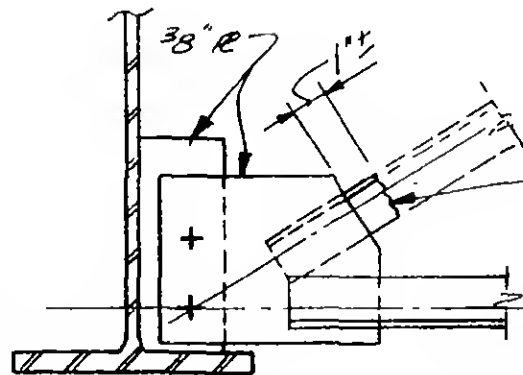
TITLE TOWER A - FLOOR 107 - BRIDGING

DATE 4-15-75

REVISIONS

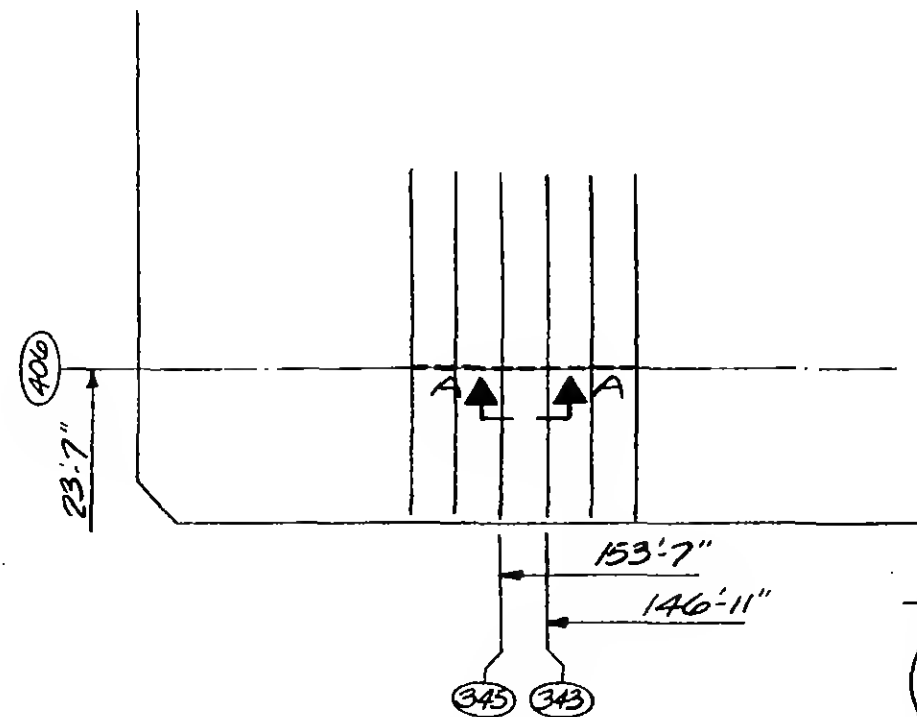


A



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19-A-1148



DESIGNED

WAB

DRAWN

JB

REVIEWED

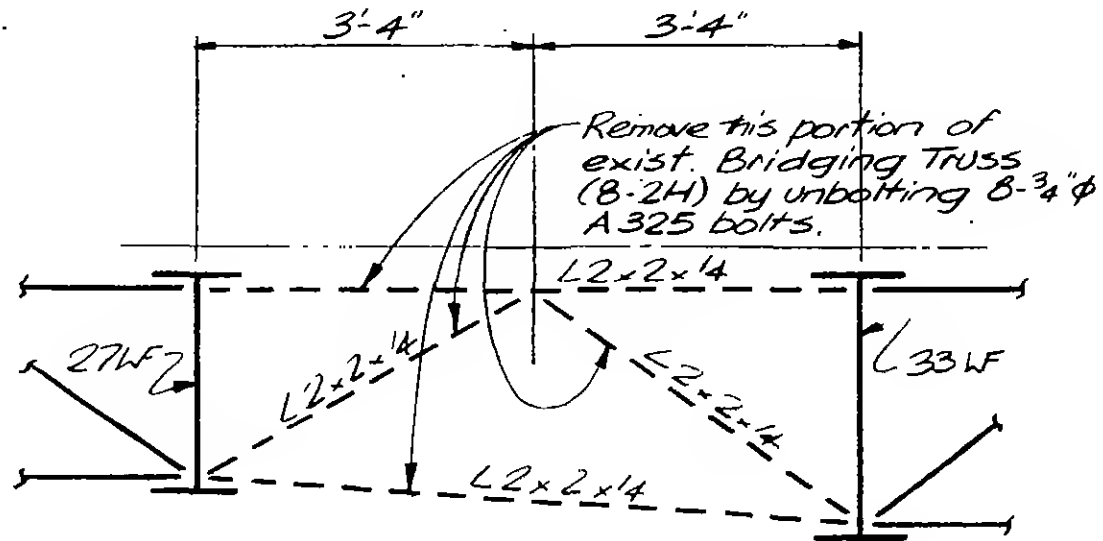
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PROJECT THE WORLD TRADE CENTER

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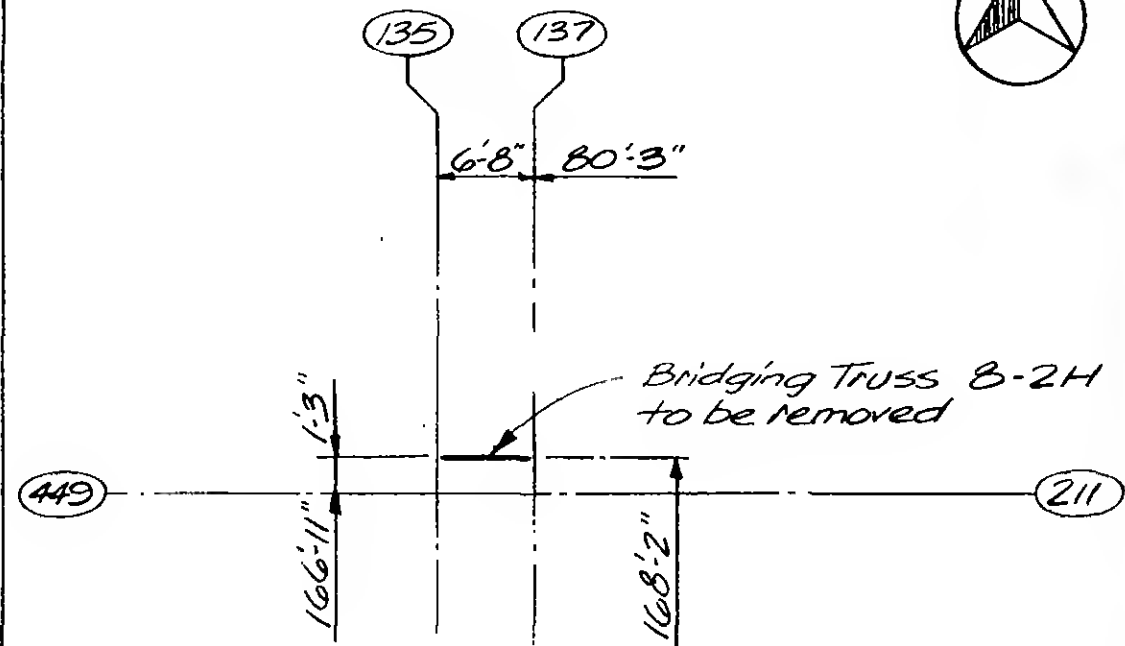
DATE 4-15-75

REVISIONS



A

NORTH



KEY PLAN (Floor 108A)



DESIGNED

JTM

DRAWN

JB

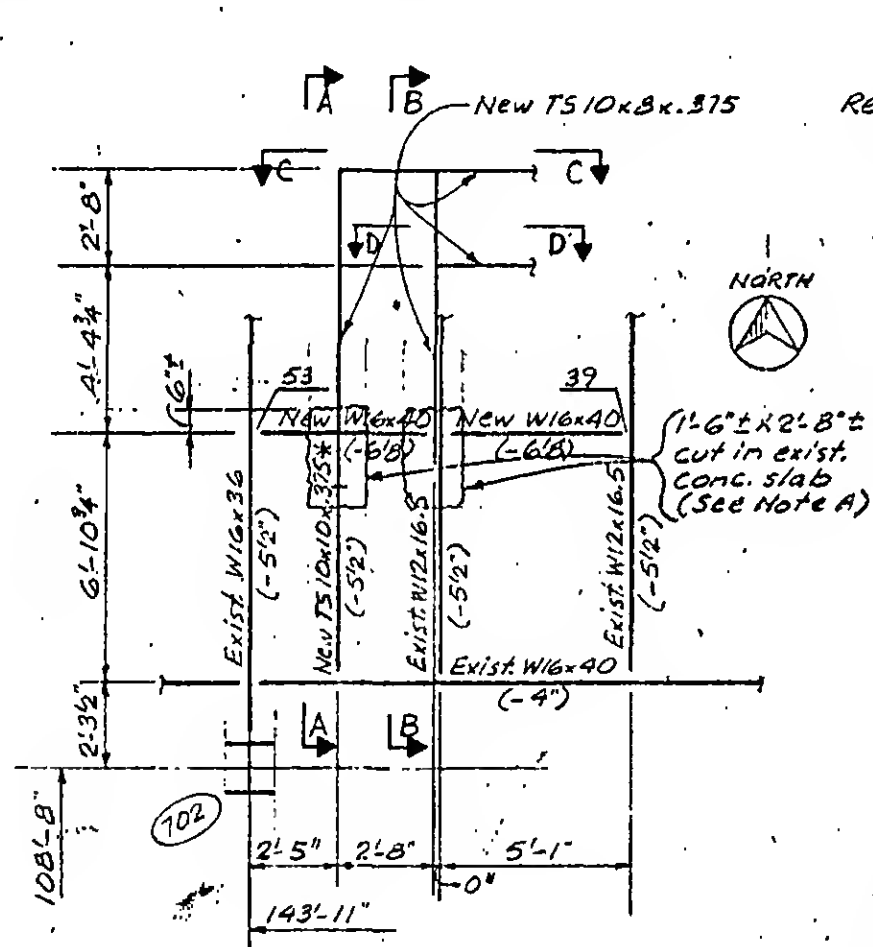
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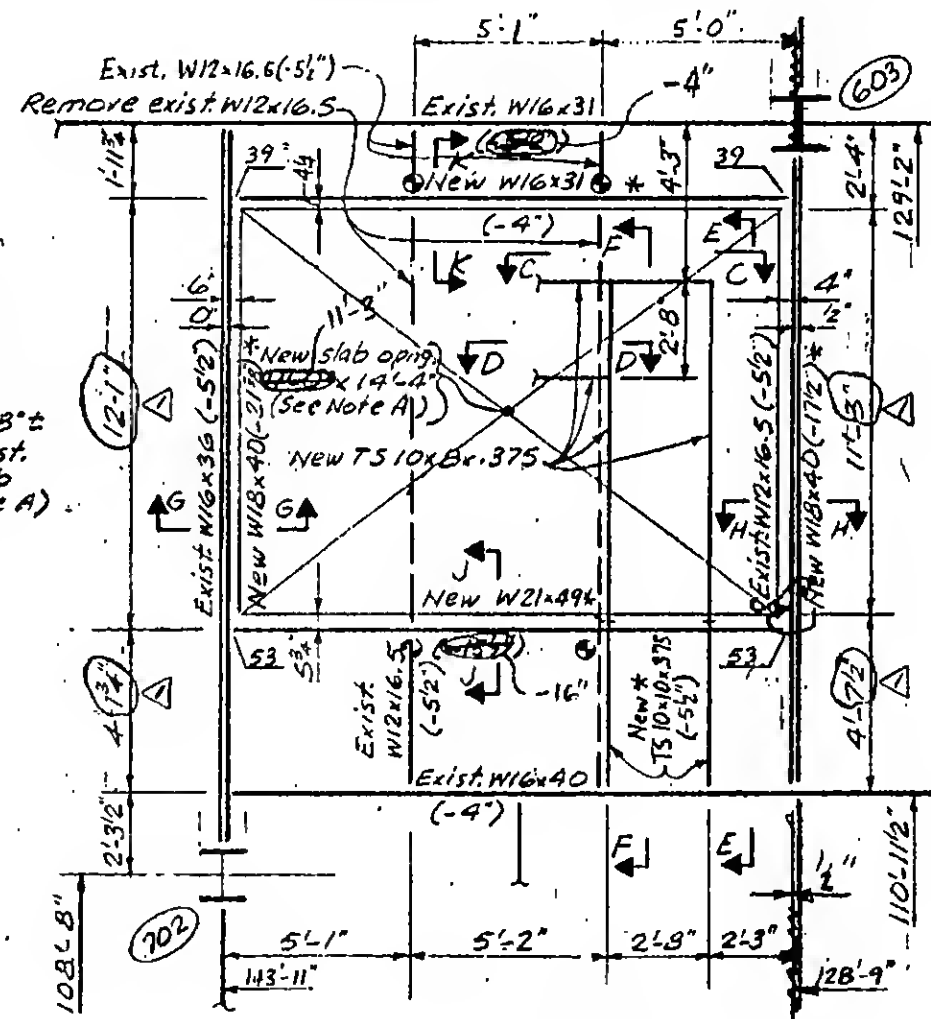
19-A-1149

REVISIONS

Add. Δ
8-8-75



Part: Plan @ Floor 91



Part Plan @ Floor 92.

General Notes:

1. All new structural steel shall have $F_y = 36 \text{ ksi}$. Beams, structural tees, plates & angles shall be ASTM A36. Tubes shall be ASTM A501.
2. All new welding (both shop & field) shall be E70xx, low hydrogen. Clean existing surfaces to be welded.
3. Bolts shall be ASTM A325 F.
4. All existing construction shall be field measured for both location and elevation before fabrication of new steel. All necessary dimensional adjustments due to field measurements shall be shown on the shop dwgs.
5. All new steel marked (*) shall receive approved spray-on fireproofing. Replace existing fireproofing removed to install new work.
6. Reactions for AISC framed beam connections are shown thus: $\frac{27}{1}$ on plan.
7. (A) Indicates temporary shoring from floor 92 to 91. Install firm concrete 1st.

19-A-1150.1



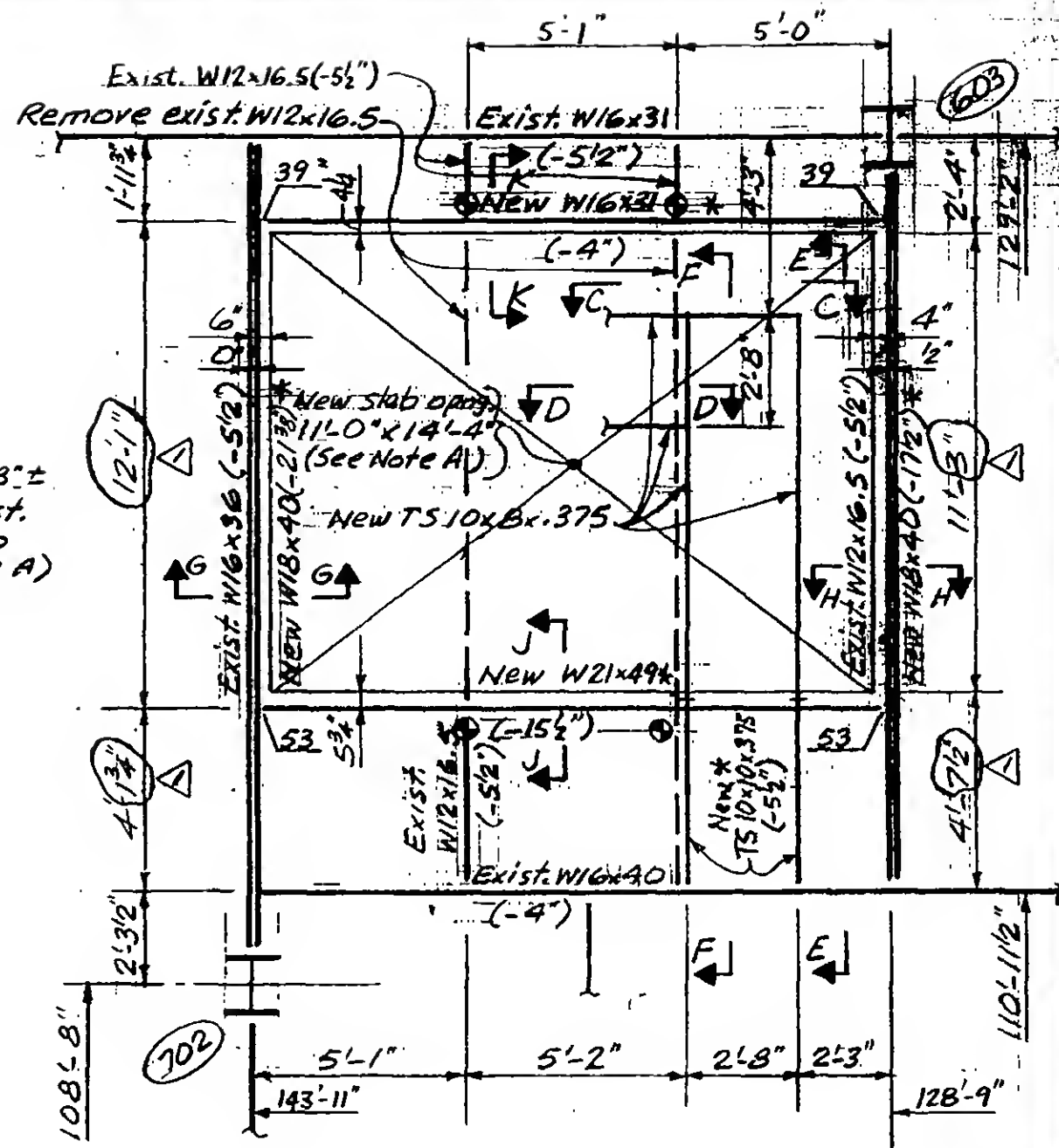
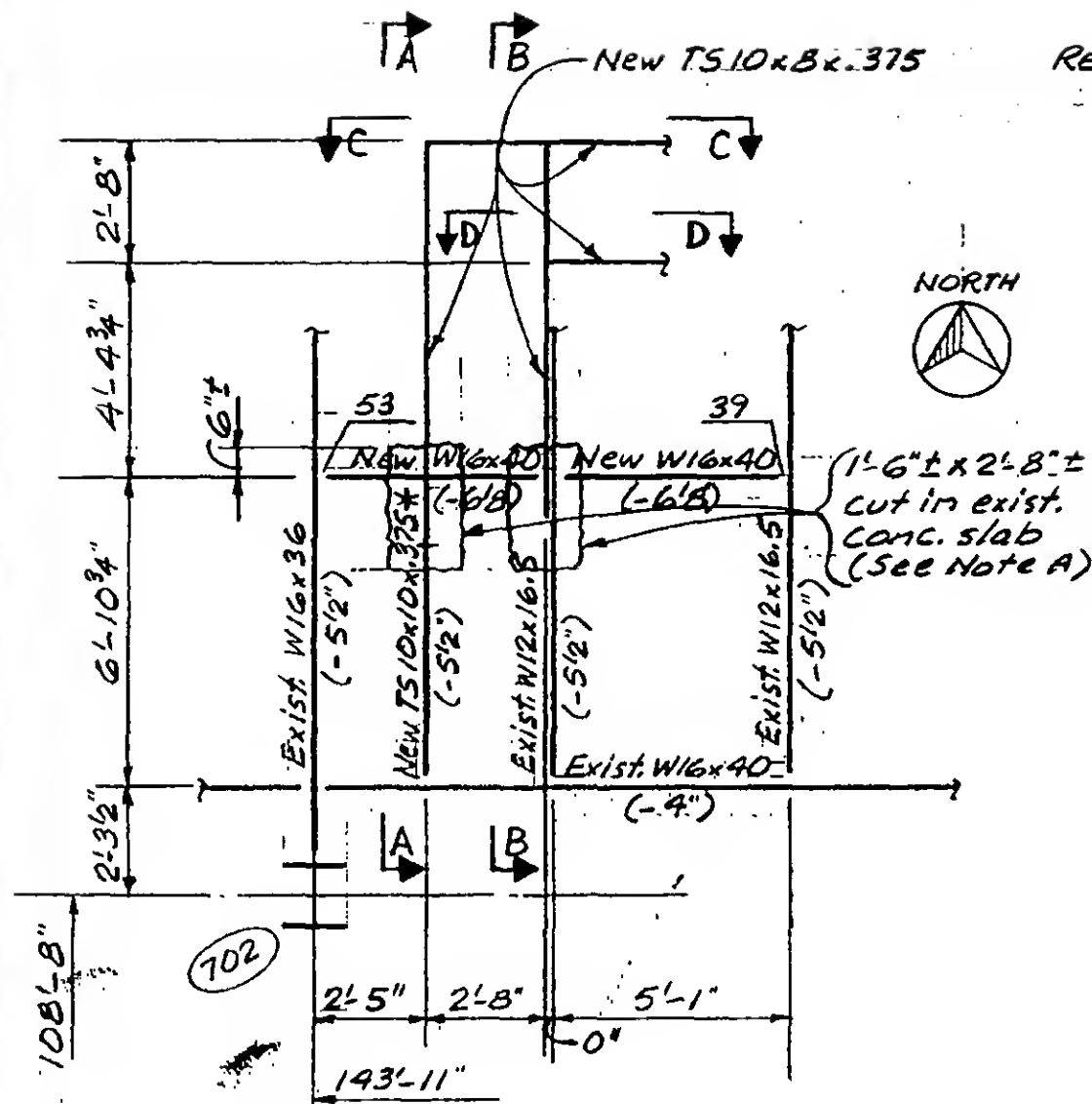
DESIGNER
J.T.M.

DRAWN
ALF

REVIEWED

REVISIONS

Add. $\triangle 1$
B-8-75

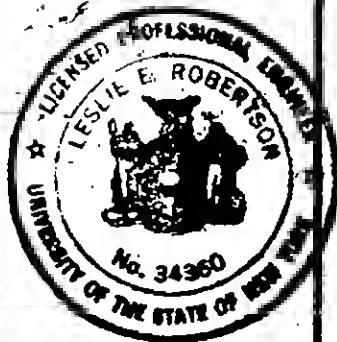


Part Plan @ Floor 91

Part Plan @ Floor 92

General Notes:

1. All new structural steel shall have $F_y = 36 \text{ ksi}$. Beams, structural tees, plates & angles shall be ASTM A36. Tubes shall be ASTM A501.
2. All new welding (both shop & field) shall be E70xx, low hydrogen. Clean existing surfaces to be welded.
3. Bolts shall be ASTM A325 F.
4. All existing construction shall be field measured for both location and elevation before fabrication of new steel. All necessary dimensional adjustments due to field measurements shall be shown on the shop dwgs.
5. All new steel marked (*) shall receive approved spray-on fireproofing. Replace existing fireproofing removed to install new work.
6. Reactions for AISC framed beam connections are shown thus: $\frac{27}{\text{on plan}}$.
7. \odot Indicates temporary shoring from floor 92 to 91. Install first, remove last.



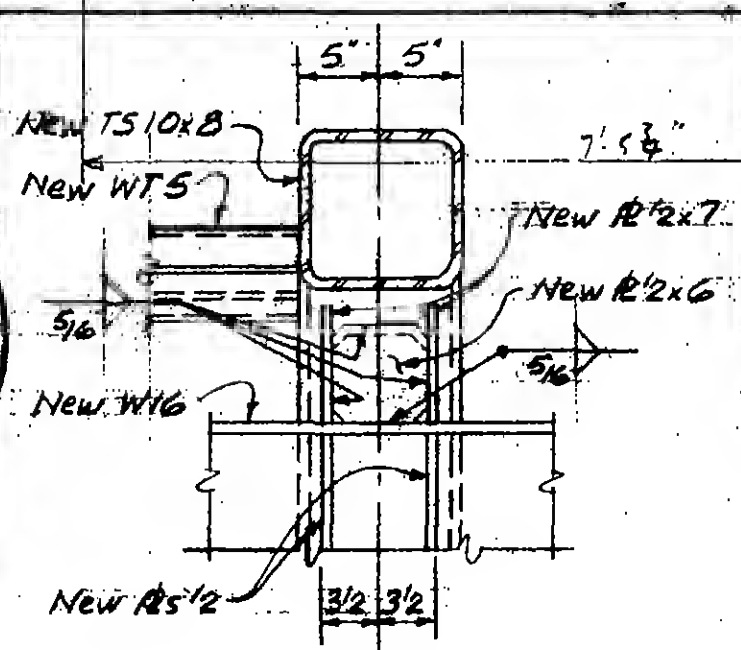
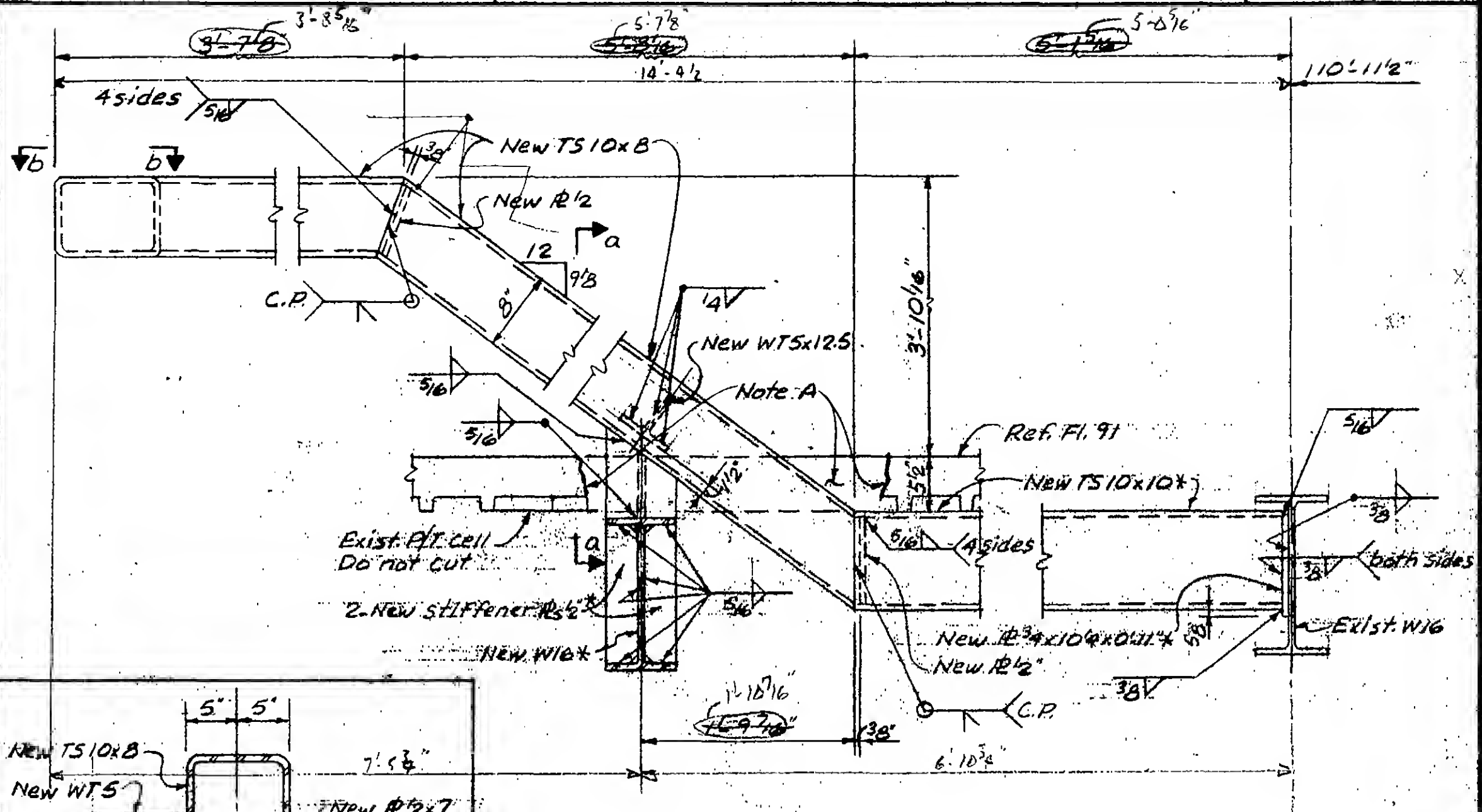
DESIGNED
JTM

DRAWN
ALF

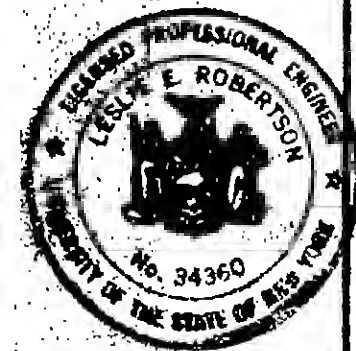
REVIEWED

19-A-1150.1

REVISIONS



Note A: Cut exist concrete slab and steel deck without damage to exist. reinf. Hook exist. reinf. at face of new steel or new opening. Patch slab by applying epoxy bonding compound to joint and casting lightweight concrete patch with $f'c = 4000$ psi. Remove debris from site.



Q.

A

19-A-1150.2

PROJECT

THE WORLD TRADE CENTER

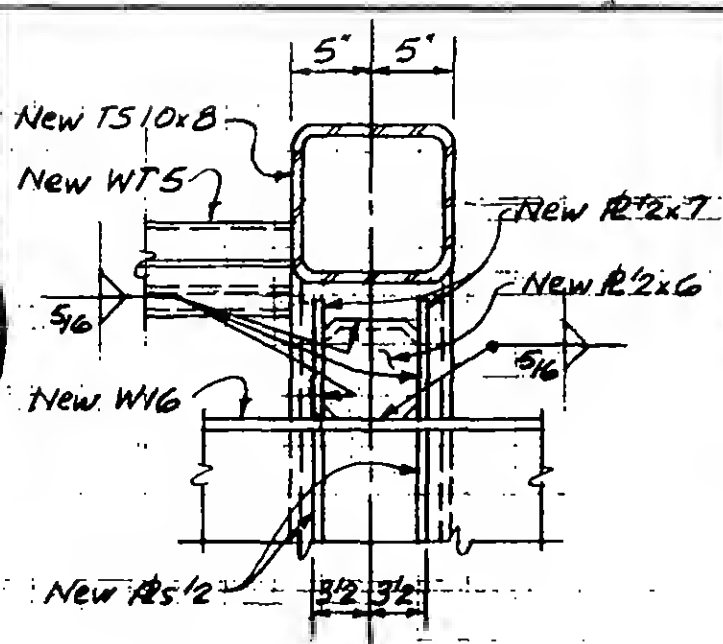
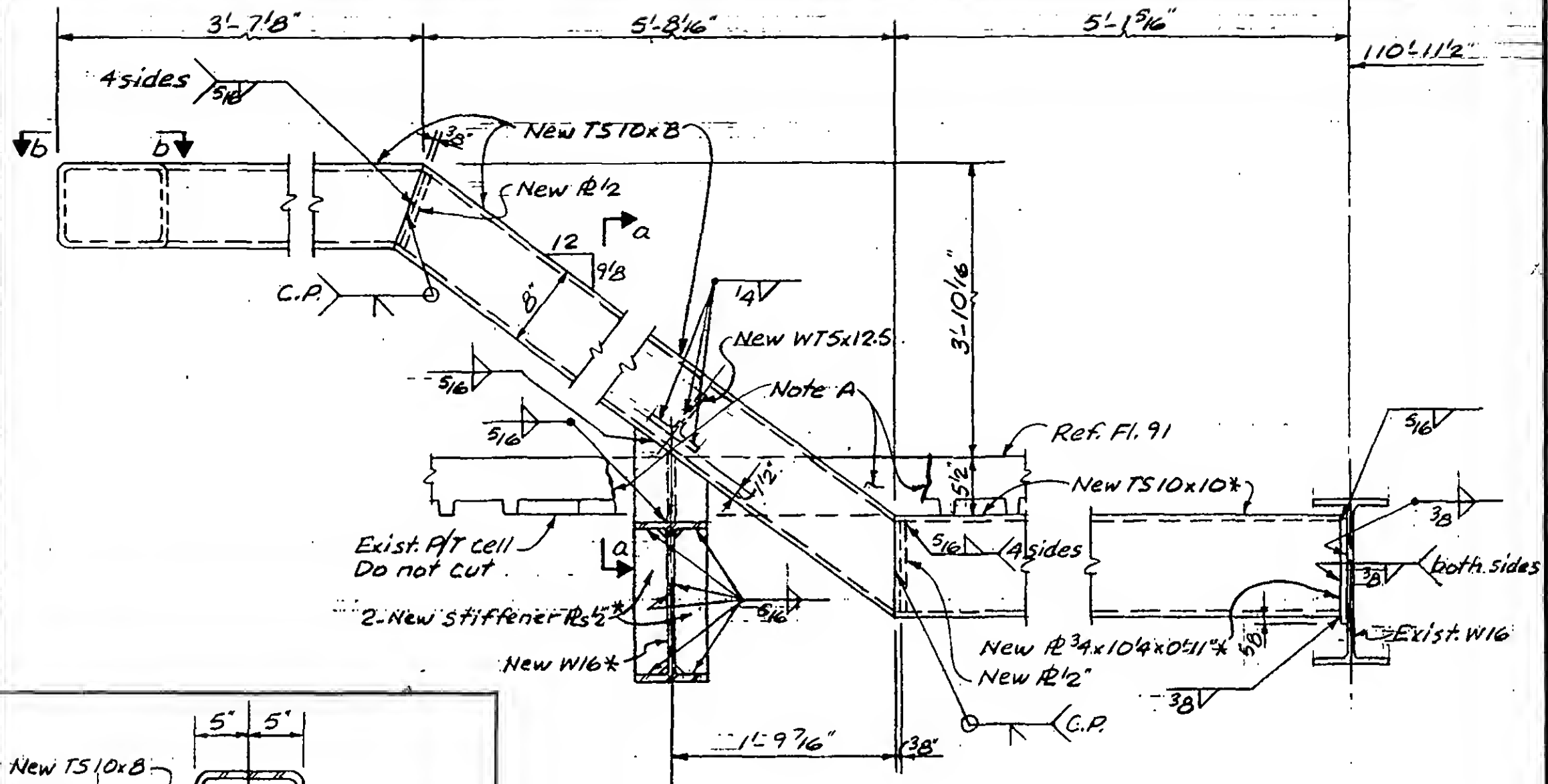
TITLE

TOWER A FLOORS 91 & 92 - STAIR SUPPORTS

DATE

5-23-75

REVISIONS



Note A. Cut exist. concrete slab and steel deck without damage to exist. reinf. Hook exist. reinf. at face of new steel or new opening. Patch slab by applying epoxy bonding compound to joint and casting lightweight concrete patch with $f'c = 4000$ psi. Remove debris from site.



DESIGNED
J.T.M.
DRAWN
A.L.F.
REVIEWED

a

A

T9-A-1150.2

SKILLING, HELLE, CHRISTIANSEN, ROBERTSON

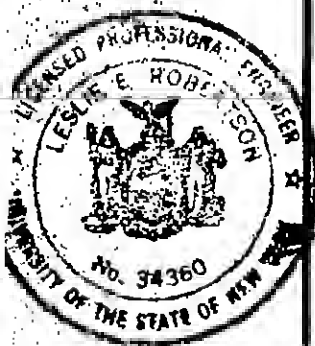
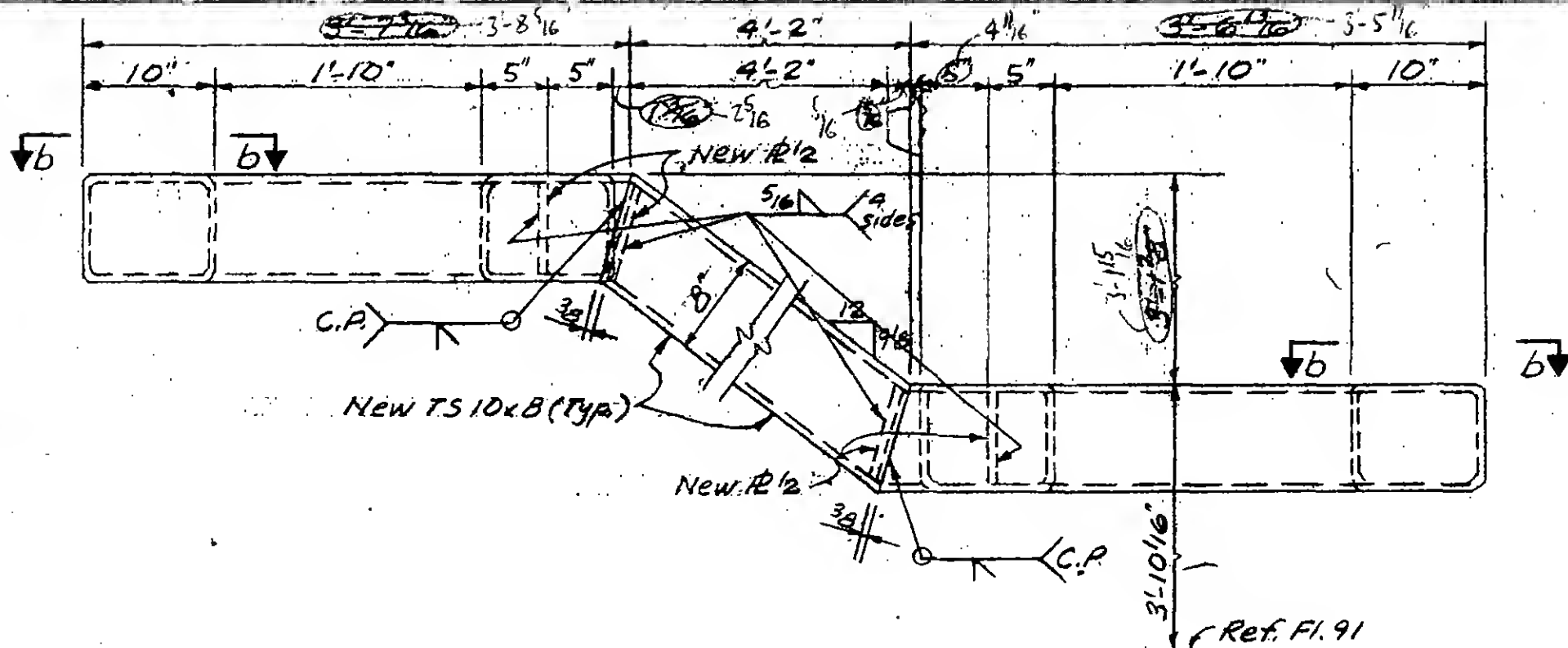
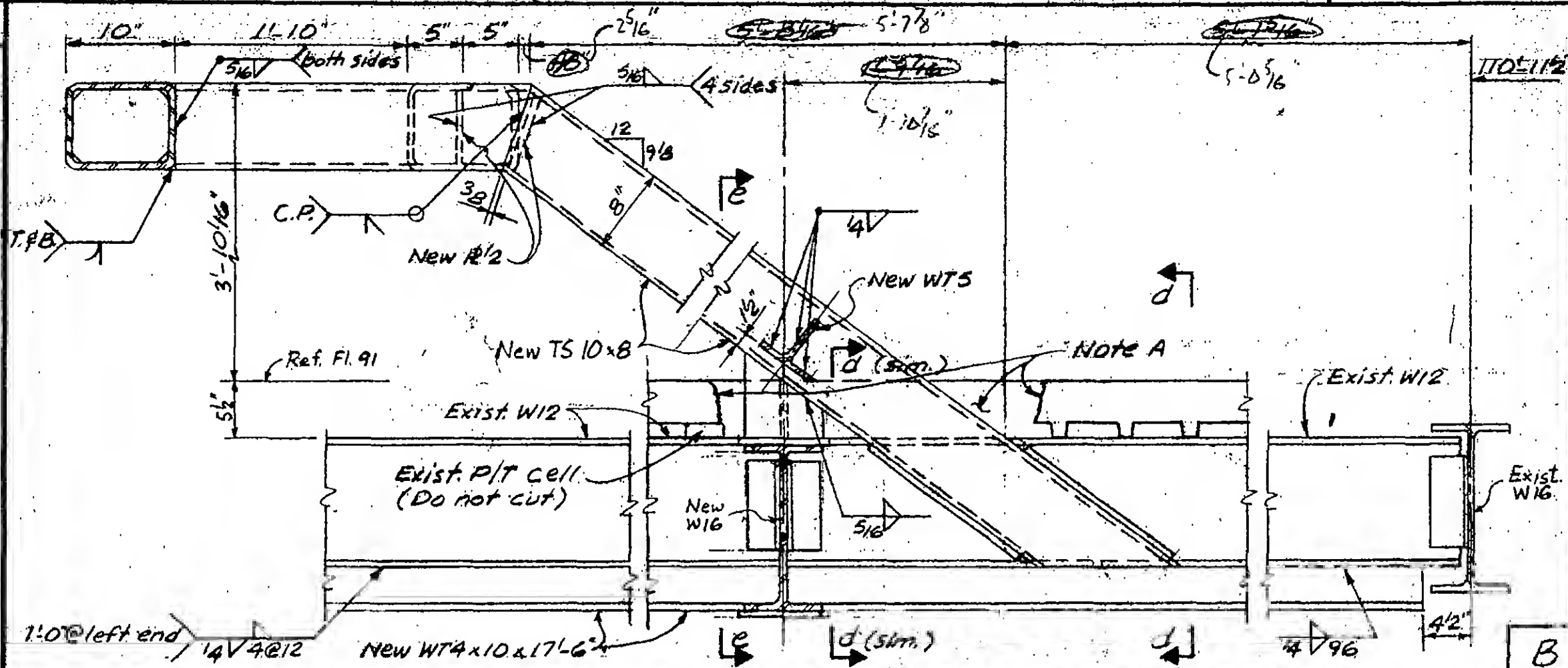
Structural & Civil Engineers

PROJECT THE WORLD TRADE CENTER

TITLE TOWER A - FLOORS 91 & 92 - STAIR SUPPORTS

DATE 5-23-75

VISIONS



DESIGNED

JTM

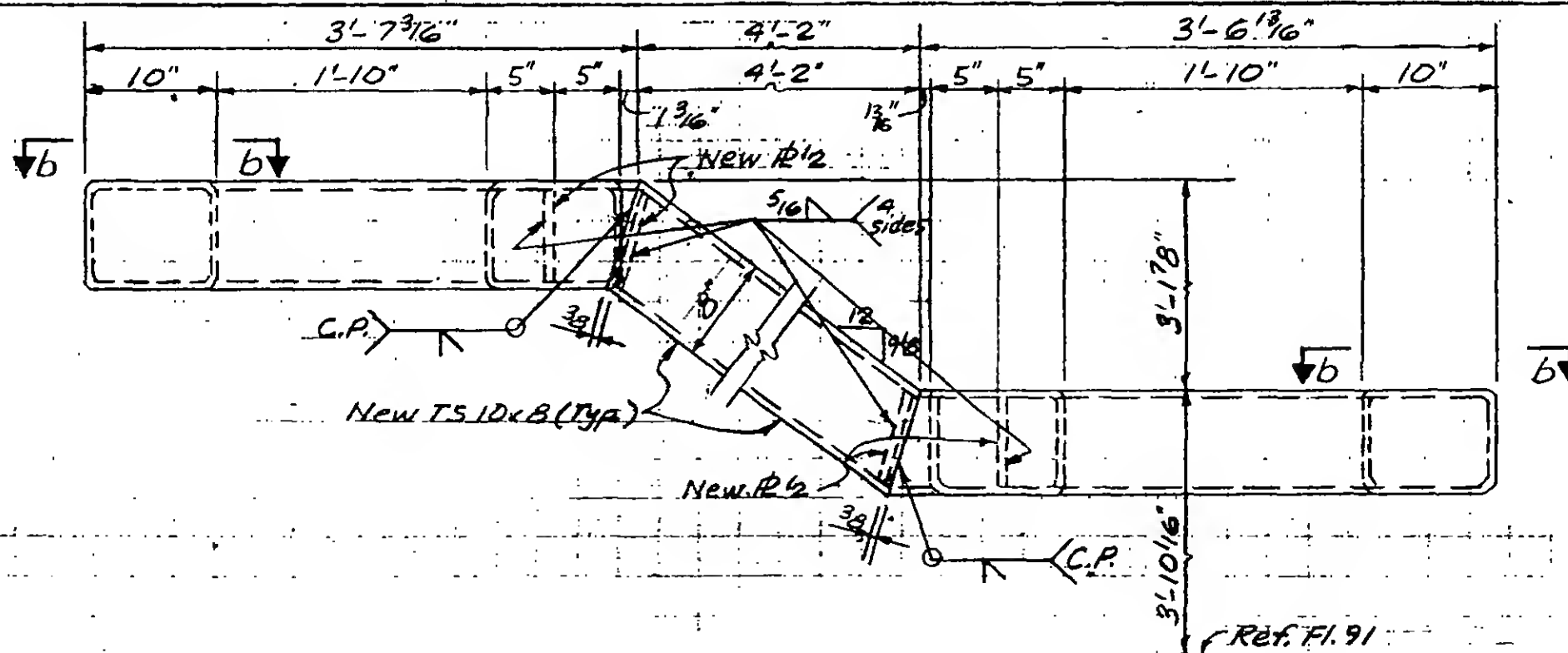
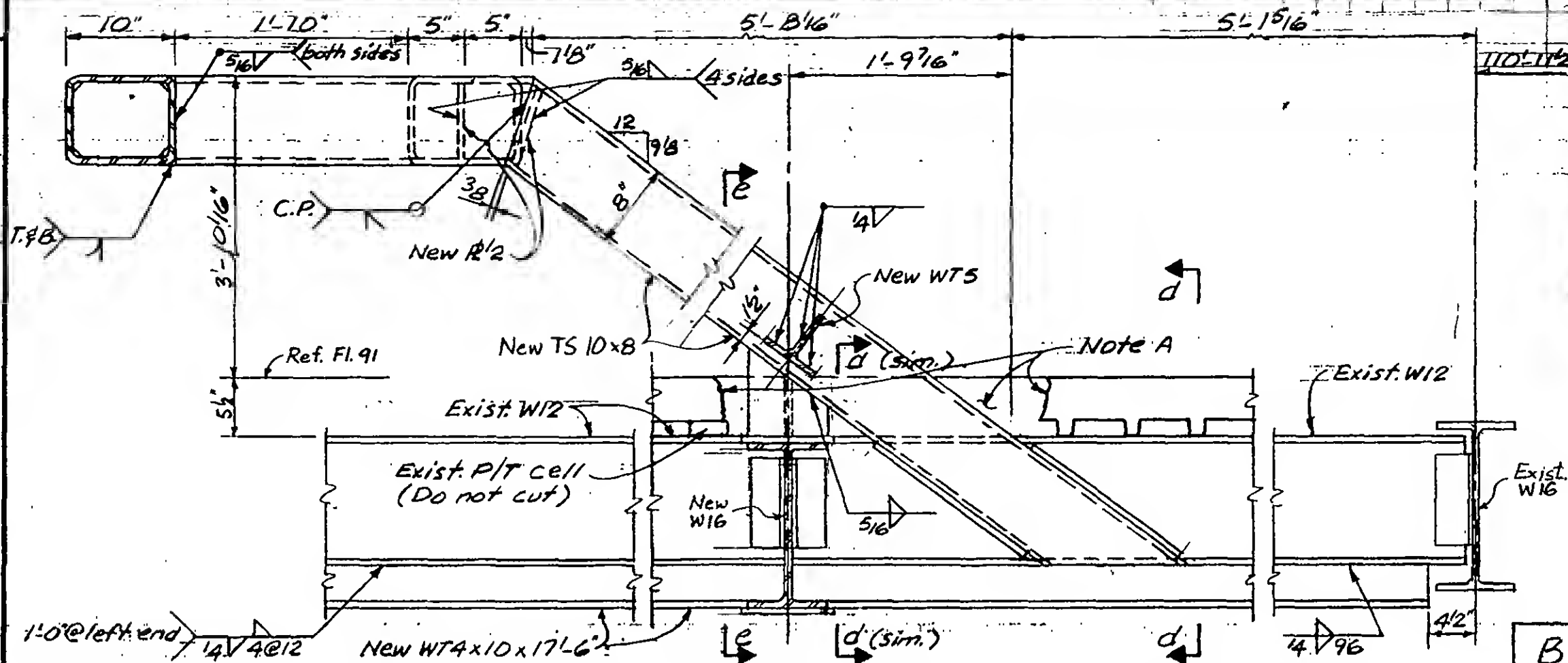
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19-A-1150.3

REVISIONS



DESTROYED
JTM

DRAWN
ALF

REVIEWED

79-A-1150.3

PROJECT

THE WORLD TRADE CENTER

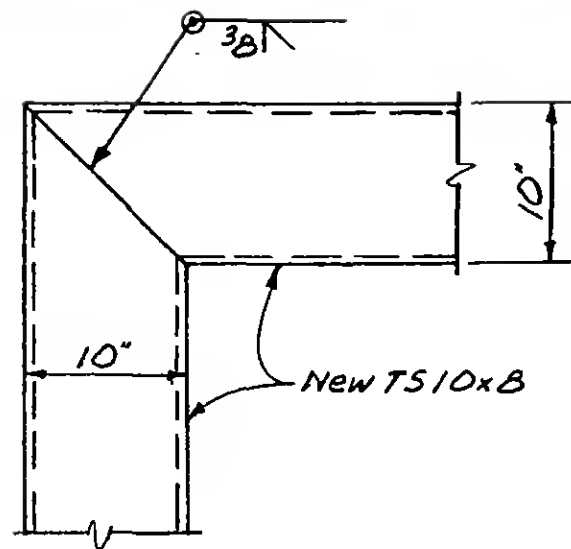
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TOWER A - FLOORS 91 & 92 - STAIR SUPPORTS

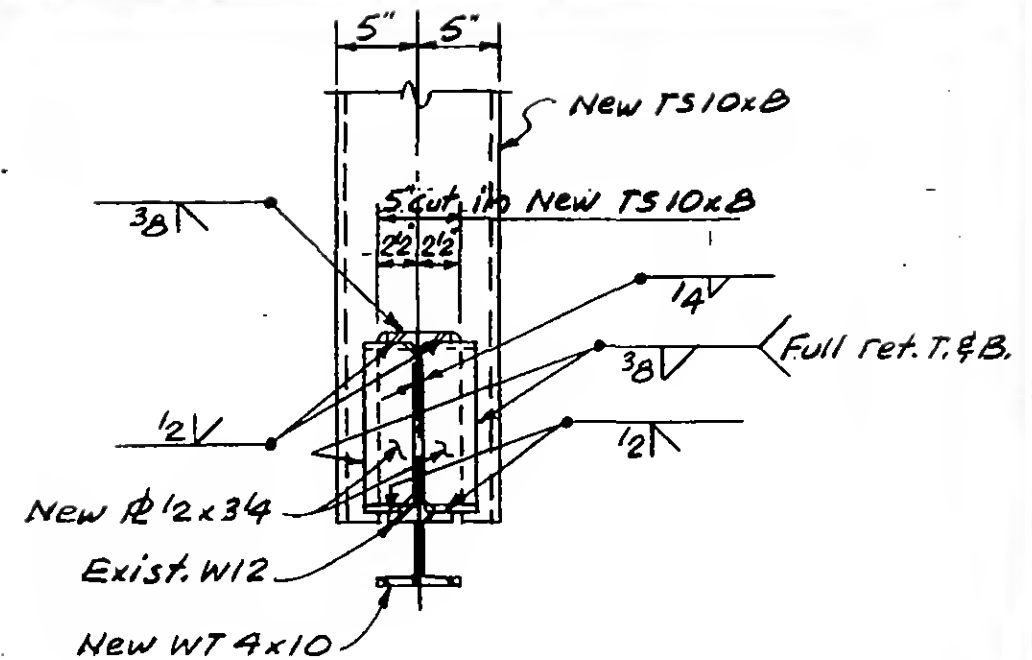
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5-23-75

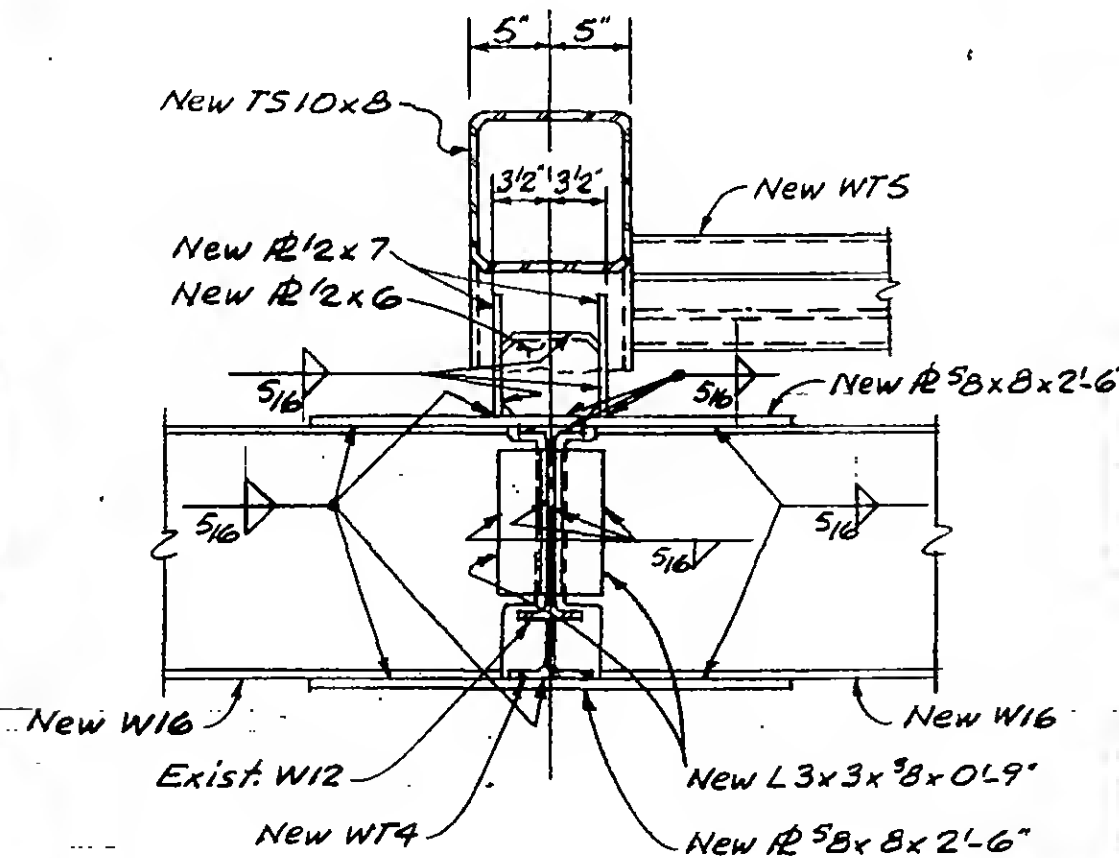
REVISIONS



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19-A-1150.4

DESIGNED
JTMDRAWN
ALF

REVIEWED

PROJECT

THE WORLD TRADE CENTER

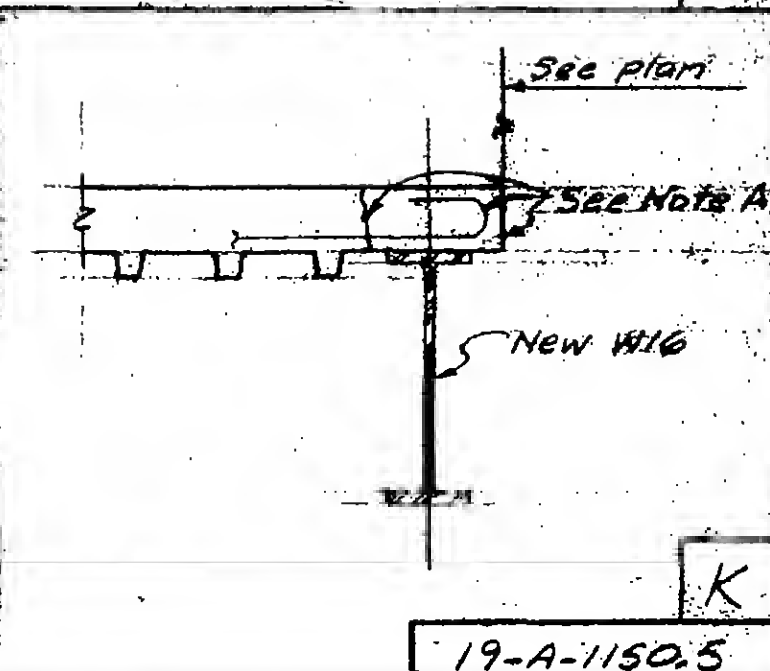
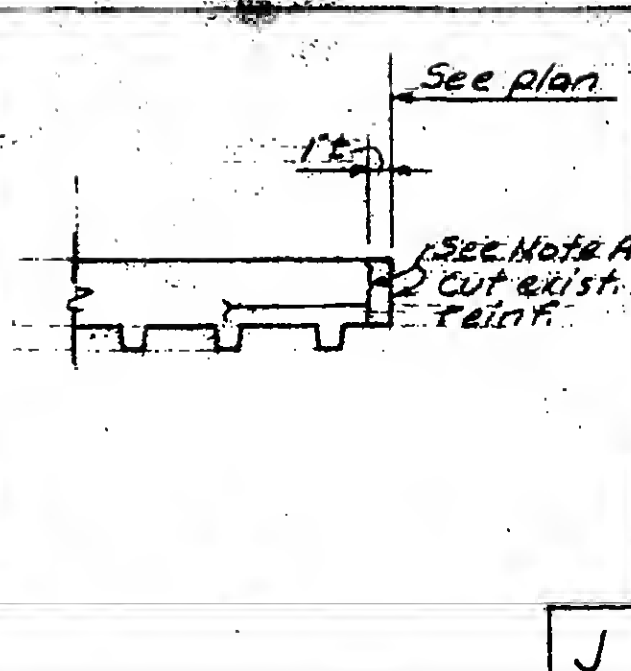
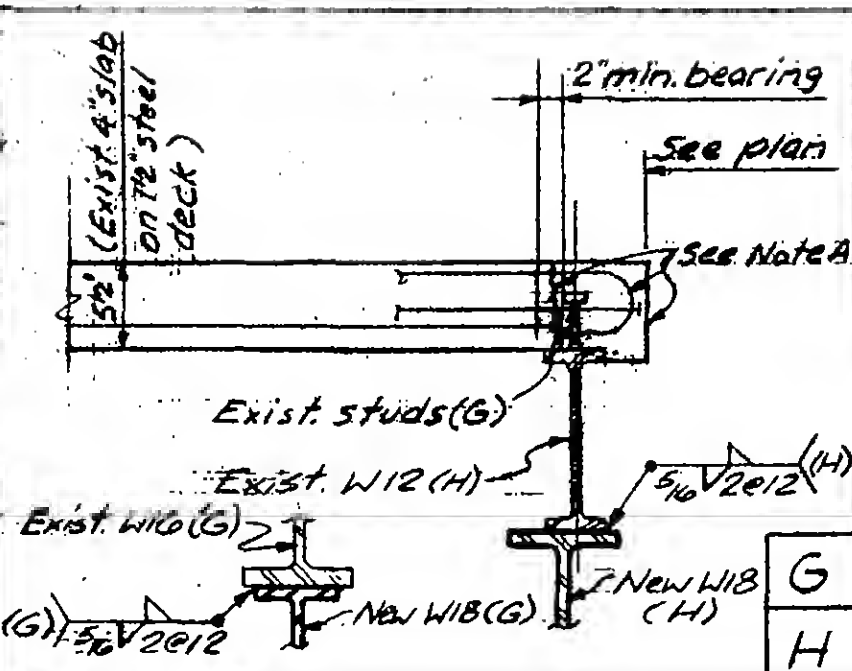
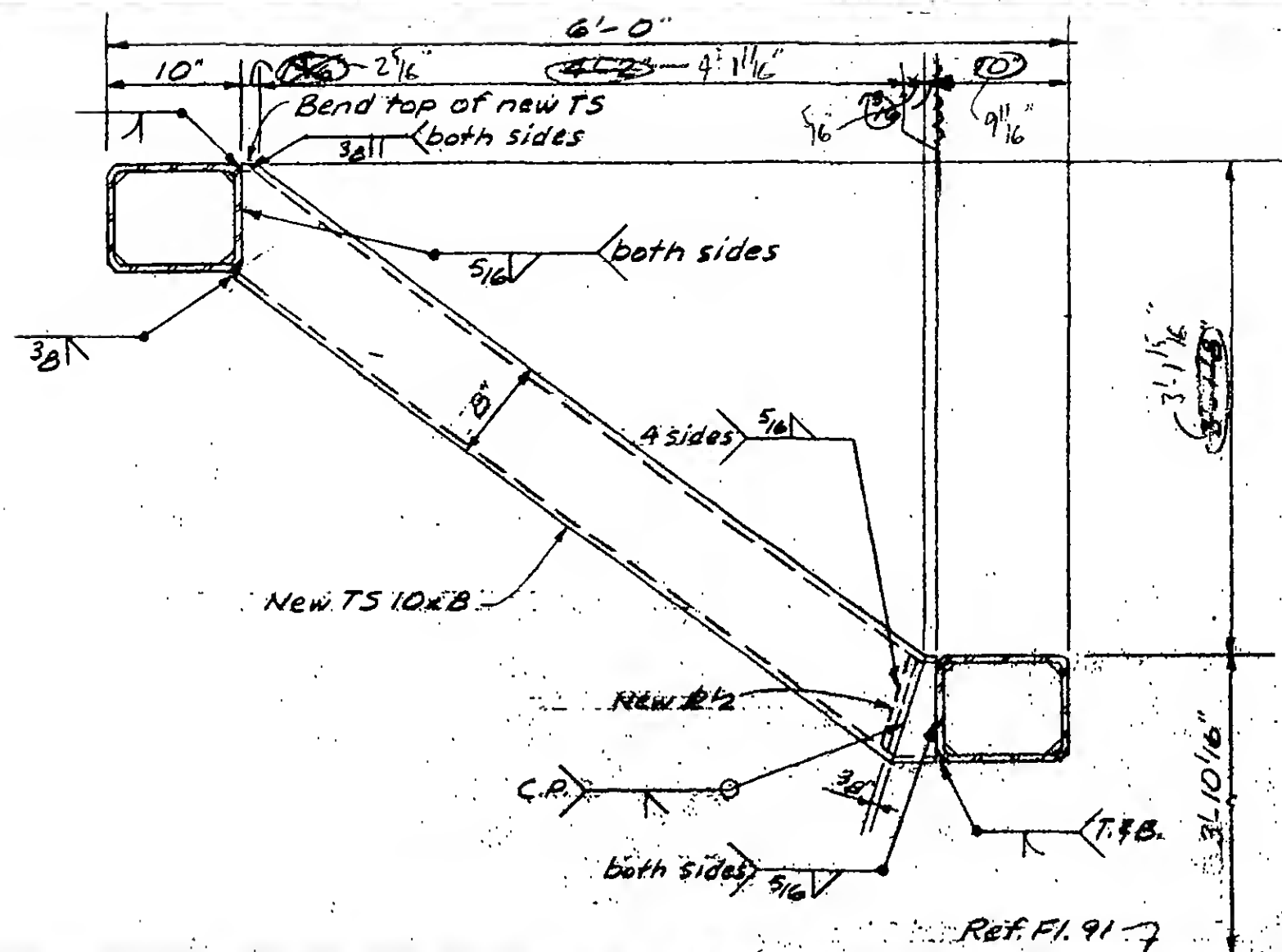
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TOWER A-FLOORS 91 & 92-STAIR SUPPORTS

DATE

5-23-75

REVISIONS

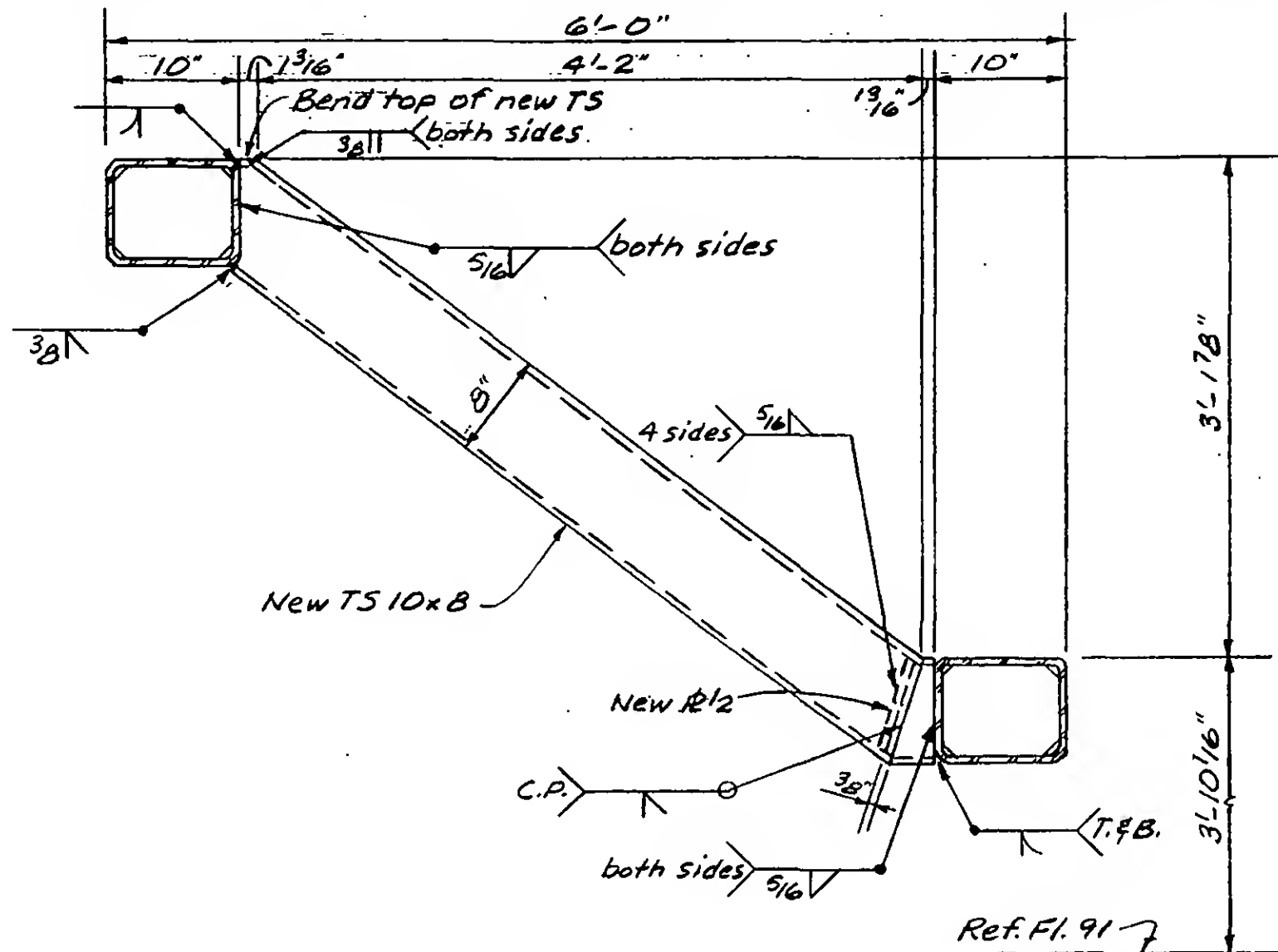


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CHECKED
REVIEWED

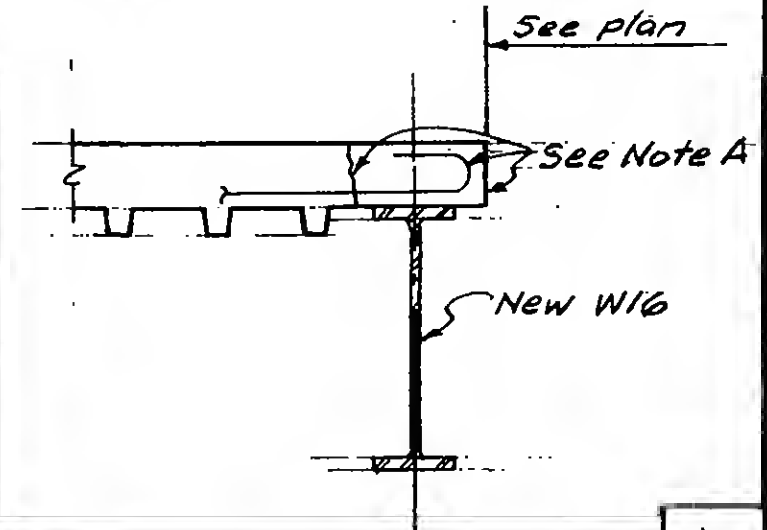
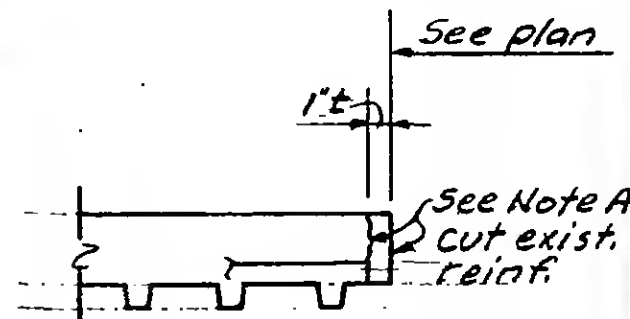
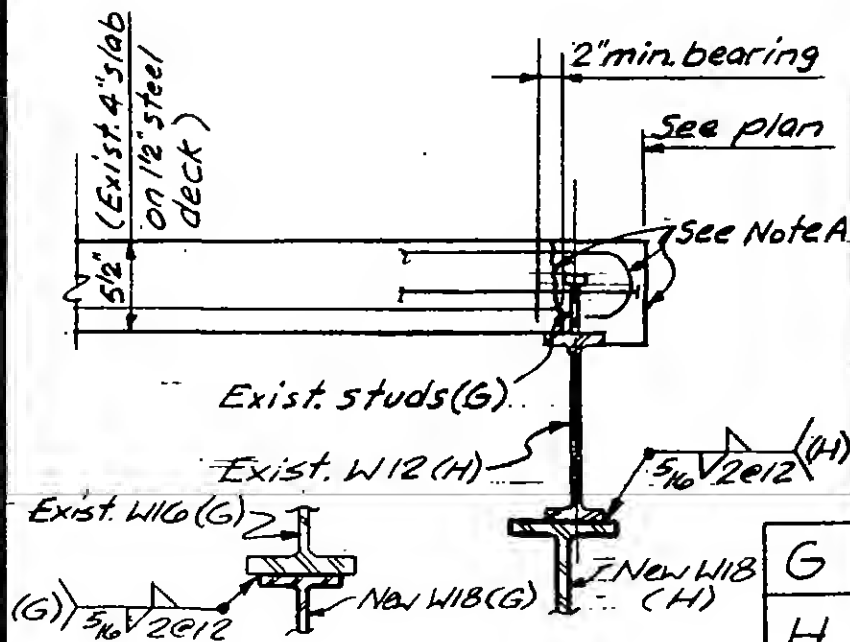
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PROJECT THE WORLD TRADE CENTERTITLE TOWER A-FLOORS 91 & 92-STAIR SUPPORTSDATE 5-23-75

REVISIONS



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JTM
DRAWN
ALF
REVIEWED



19-A-1150.5

SKILLING, HELLE, CHRISTIANSEN, ROBERTSON

Structural & Civil Engineers

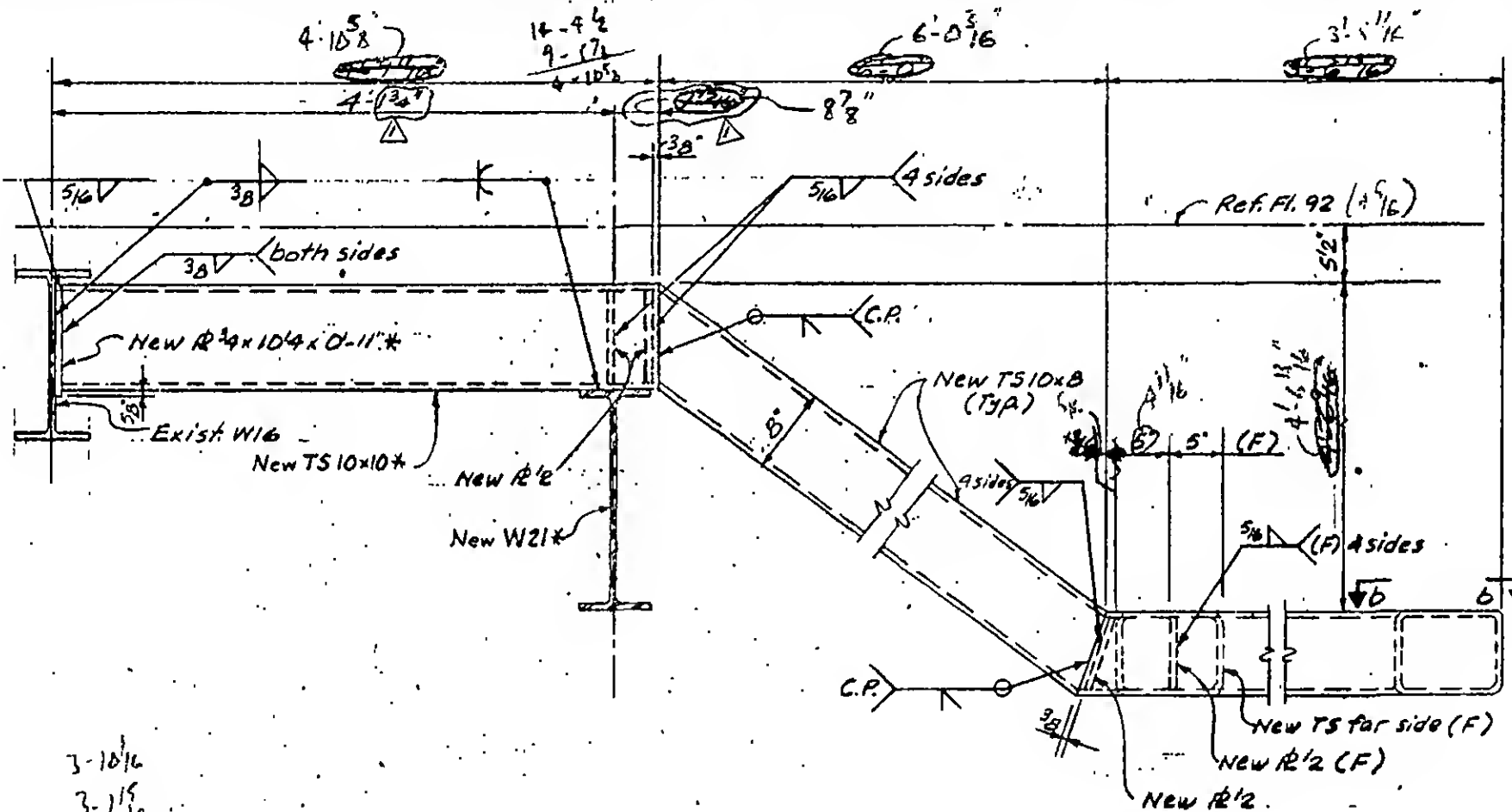
PROJECT THE WORLD TRADE CENTER

TITLE TOWER A - FLOORS 91 & 92 - STAIR SUPPORTS

DATE 5-23-75

REVISIONS

Add. Δ
8-8-75



DESIGNED JTM

DRAWN ALF

REVIEWED

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19-A-1150.6

Structural & Civil Engineers

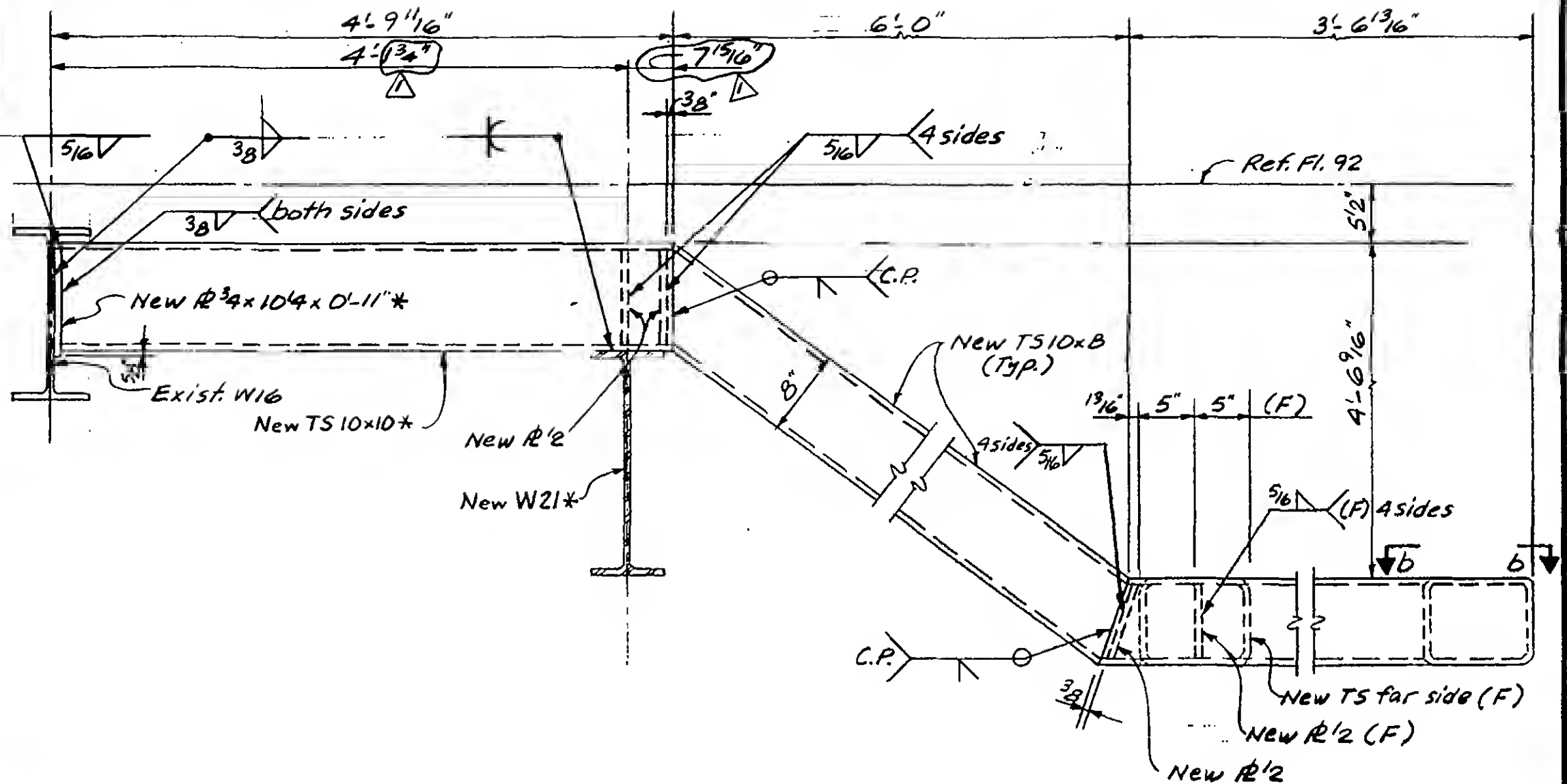
PROJECT THE WORLD TRADE CENTER

TITLE TOWER A-FLOORS 91 & 92-STAIR SUPPORTS

DATE 5-23-75

REVISIONS

Add. ①
8-8-75



DESIGNED
JTM

DRAWN
ALF

REVIEWED

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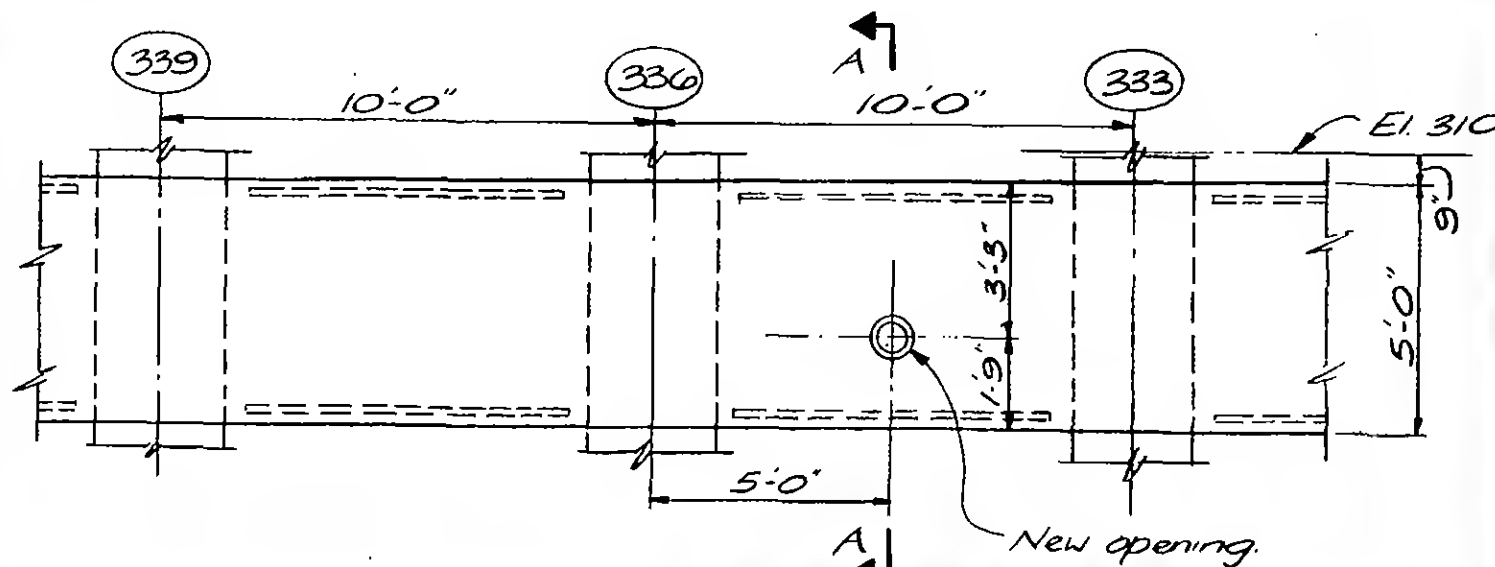
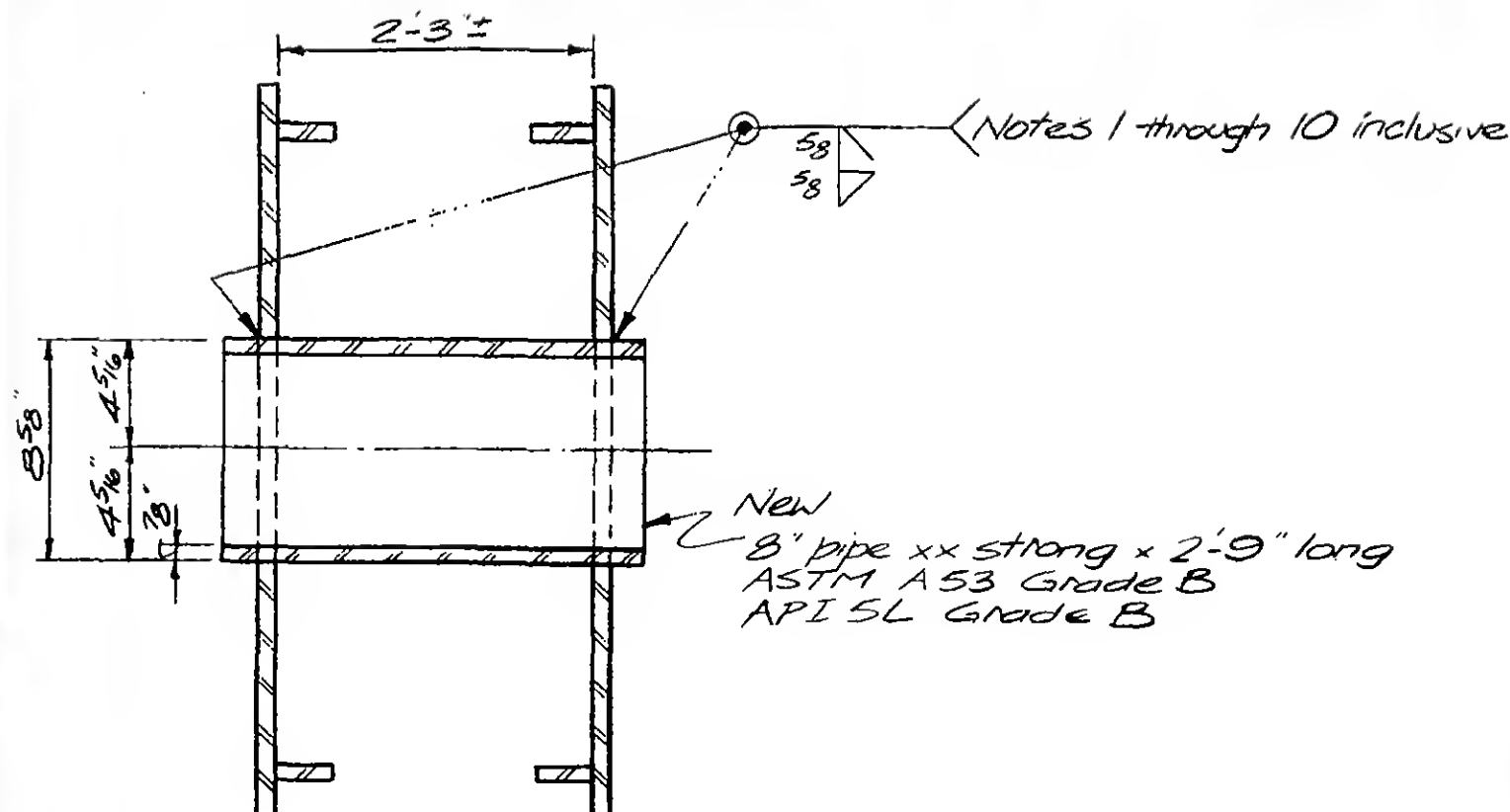
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PROJECT THE WORLD TRADE CENTER

TITLE FIELD REPAIR EL. 310 SPANDREL TOWER A

DATE 9-4-75

REVISIONS

ELEVATION

1. Scribe circular cut guide line on face of each spandrel using compass, circular guide line to have a diameter of 8-7/8 inches.
2. Carefully gas burn with oxy-acetylene torch each hole making sure to provide a smooth, notch-free cut as close as possible to (but always inside) the cut line.
3. Repair with E7018 weld metal all notches or excessive serrations, then grind smooth.
4. Insert 8"XXS pipe, center in holes, and tack weld in place.
5. Arcair gouge 5/8 inch deep by 40 to 50 degree bevel into spandrel base metal top 1/2 (180°) of pipe, one spandrel. Take care not to gouge pipe.
6. Preheat and fill weld groove with E7018 weld metal with sufficient weave or stringer bead passes to bring weld metal flush with spandrel face.
7. Repeat 5 and 6 for second spandrel.
8. Perform 5 and 6 for bottom half of pipe, each spandrel. Make sure "bottom half" weld ends are thoroughly fused without void, slag pocker, cracking or cold lap to "top half" weld ends.
9. Perform fillet weld all around each spandrel.
10. UT

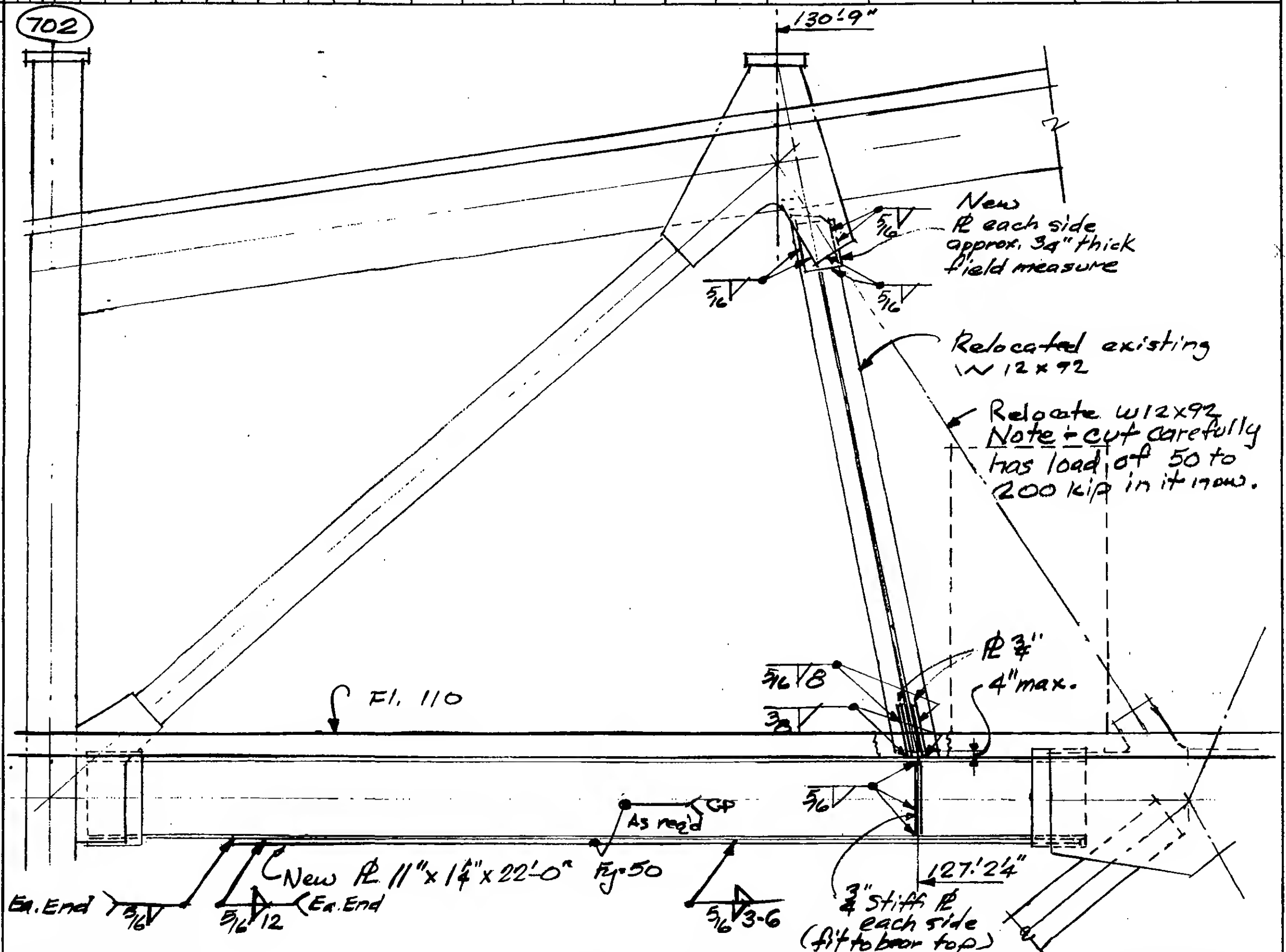
DESIGNED *WAB*DRAWN *J. Banks*

REVIEWED

A

19-A-1151

702



DESIGNED

PROJECT

WTC

TITLE

TOWER A 110th Fl. BRACE

DATE 3/30/77

DRAWN

SKILLING, HELLE, CHRISTIANSEN, ROBERTSON

Structural & Civil Engineers

DWG. NO. 19-A-1152

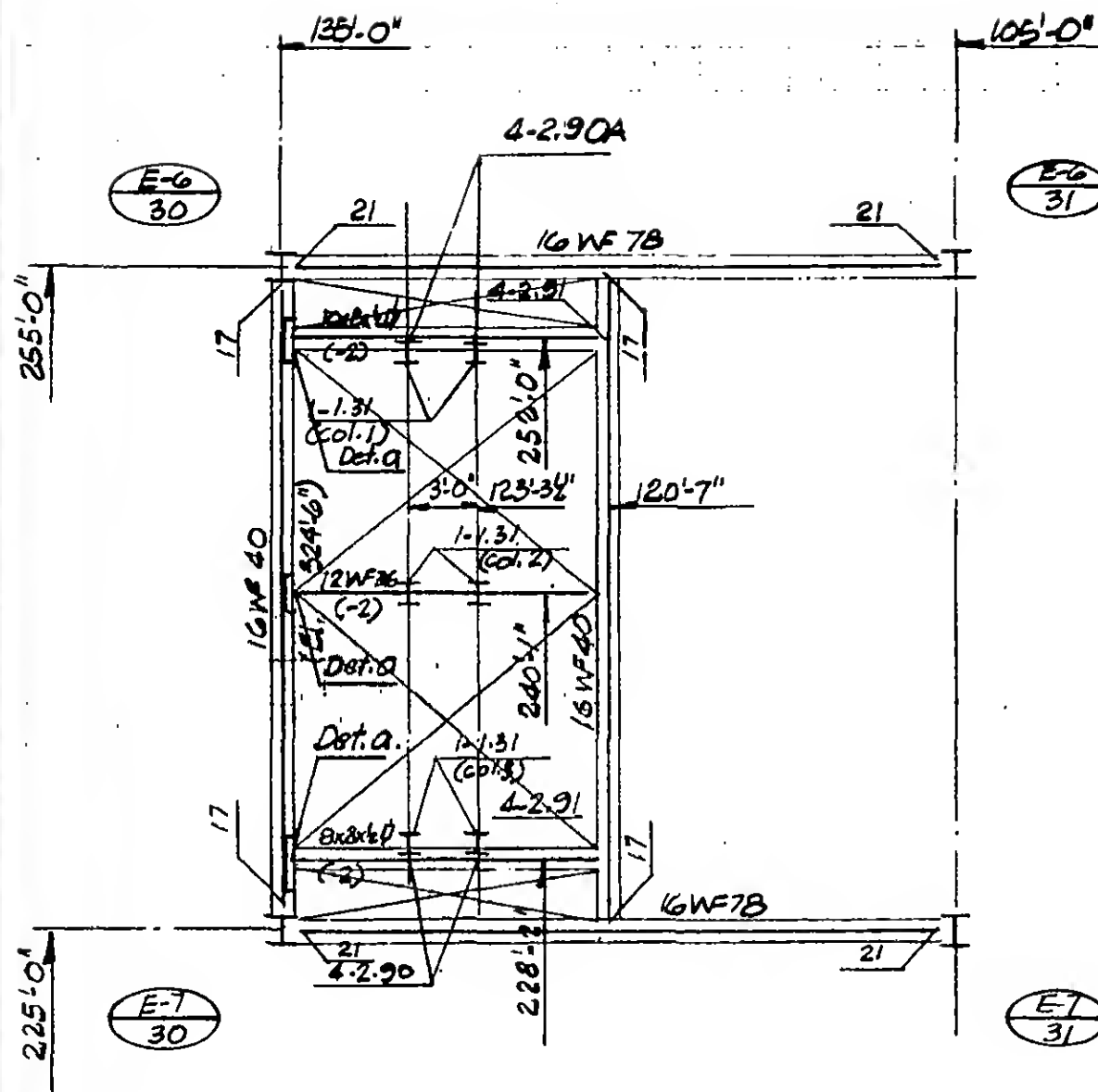
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PROJECT THE WORLD TRADE CENTER

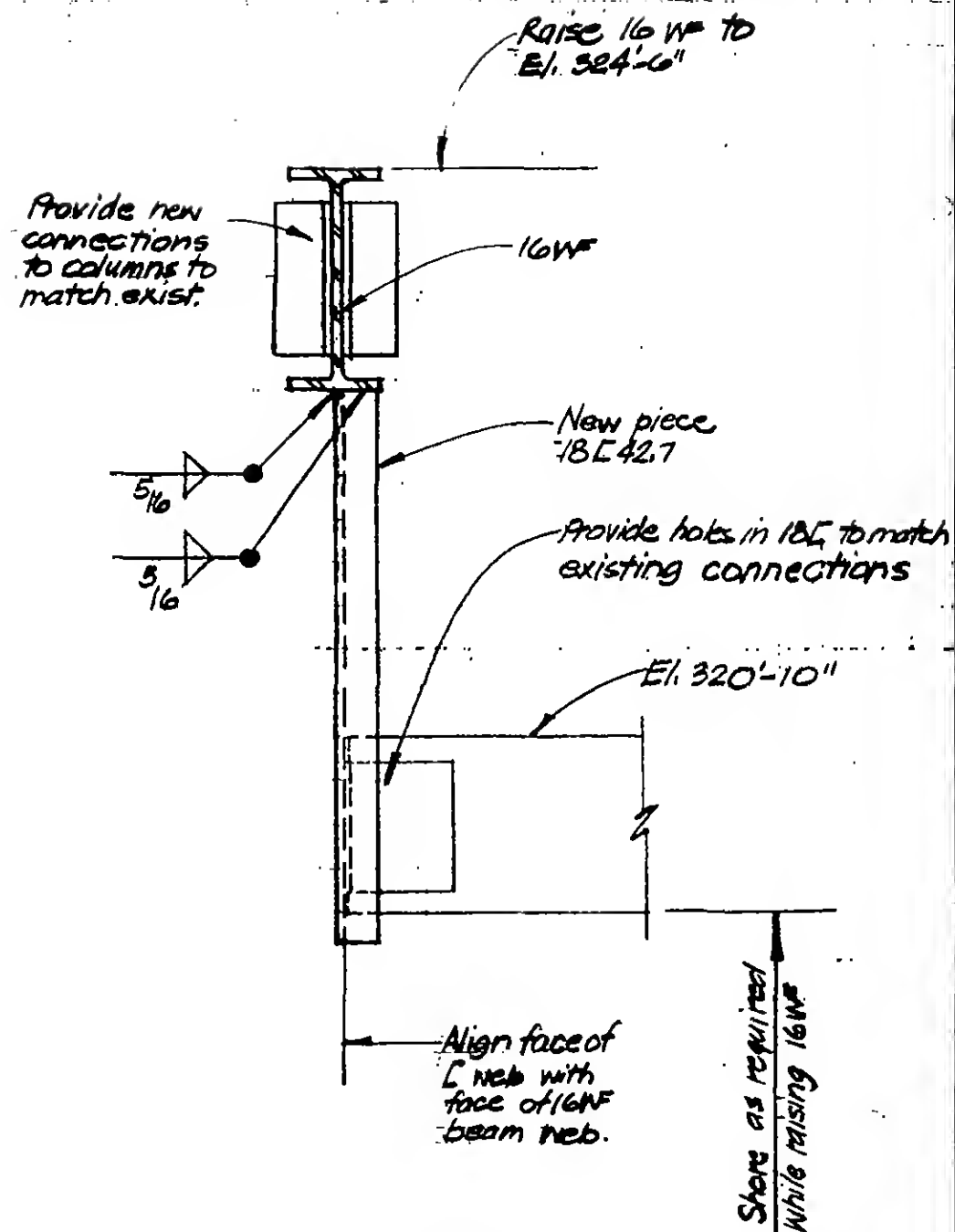
TITLE N.E. BLDG FIELD REPAIR DETAIL

DATE 3-15-71

REVISIONS



PART PLAN

Top of structural steel
referred from El. 321'-0"

Detail a



DESIGNED

WAB

DRAWN

P. C. C.

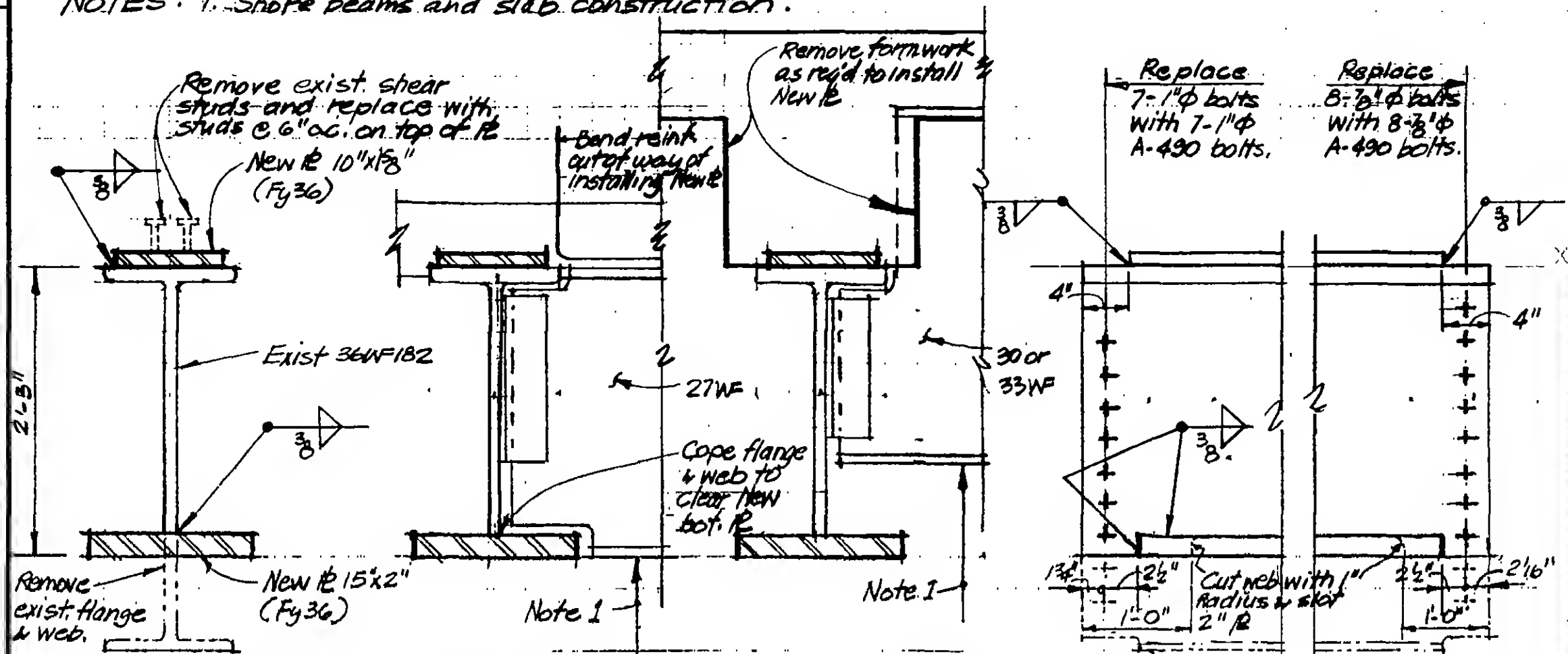
REVIEWED

19-E-2001

REVISIONS

3-22-71

NOTES: 1. Shore beams and slab construction.



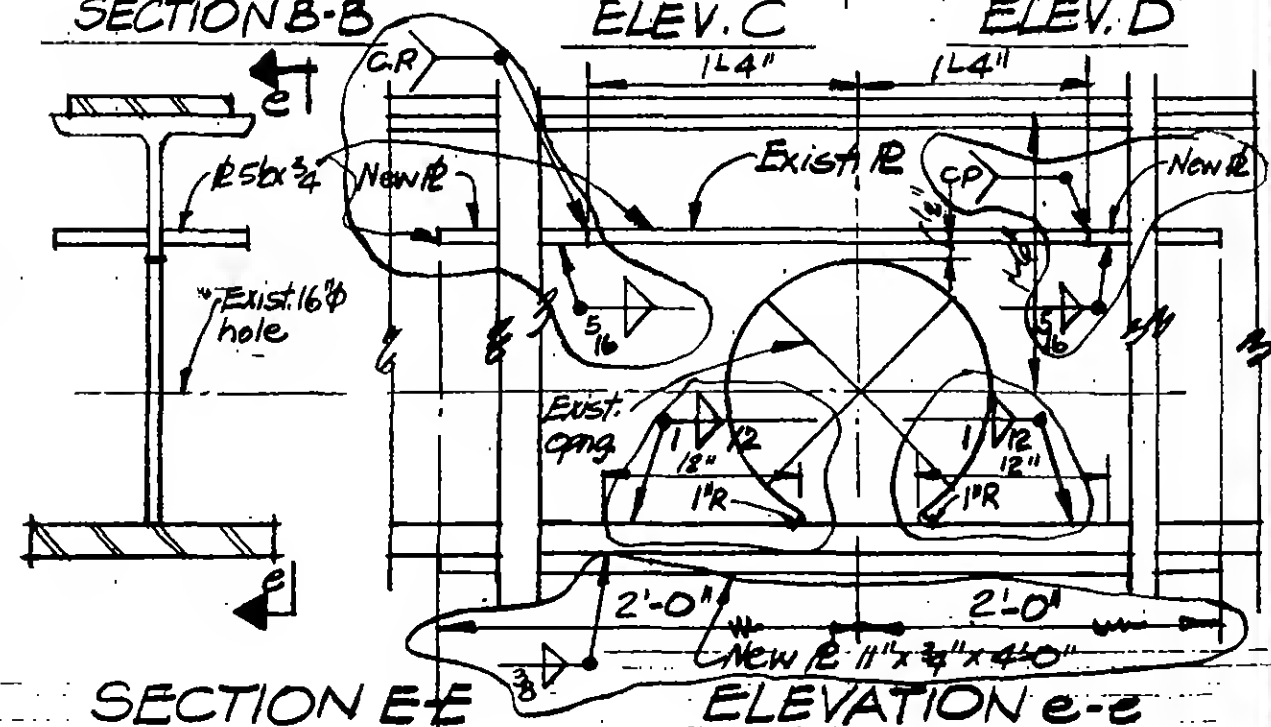
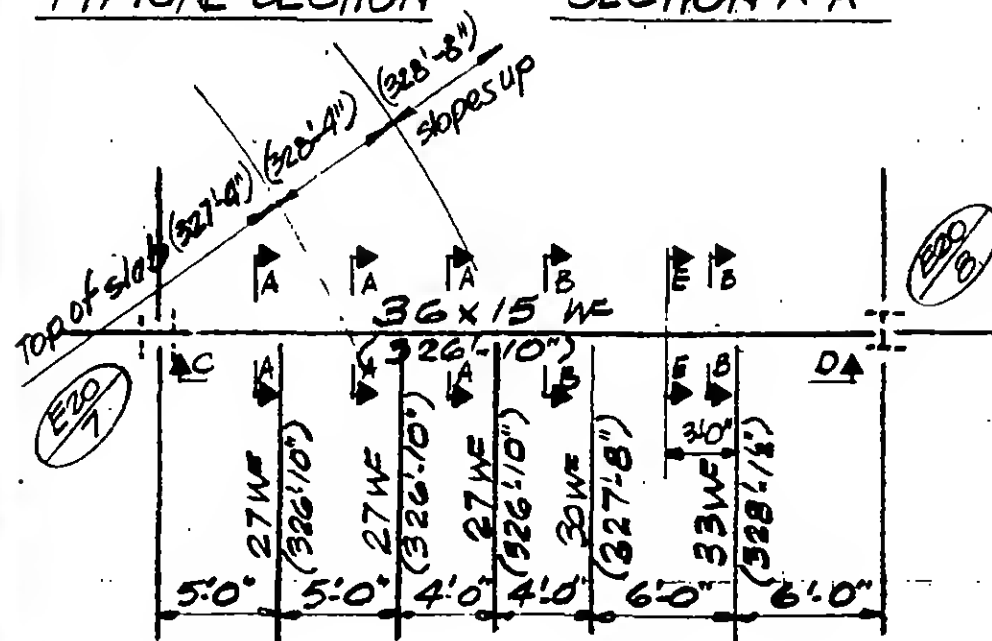
TYPICAL SECTION

SECTION A-A

SECTION B-B

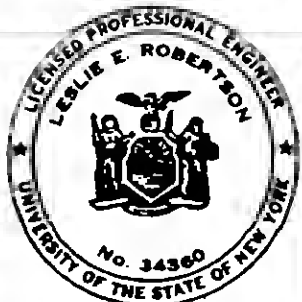
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SECTION E-E

ELEVATION e-e



DESIGNED **WAB**

DRAWN *P. Carter*

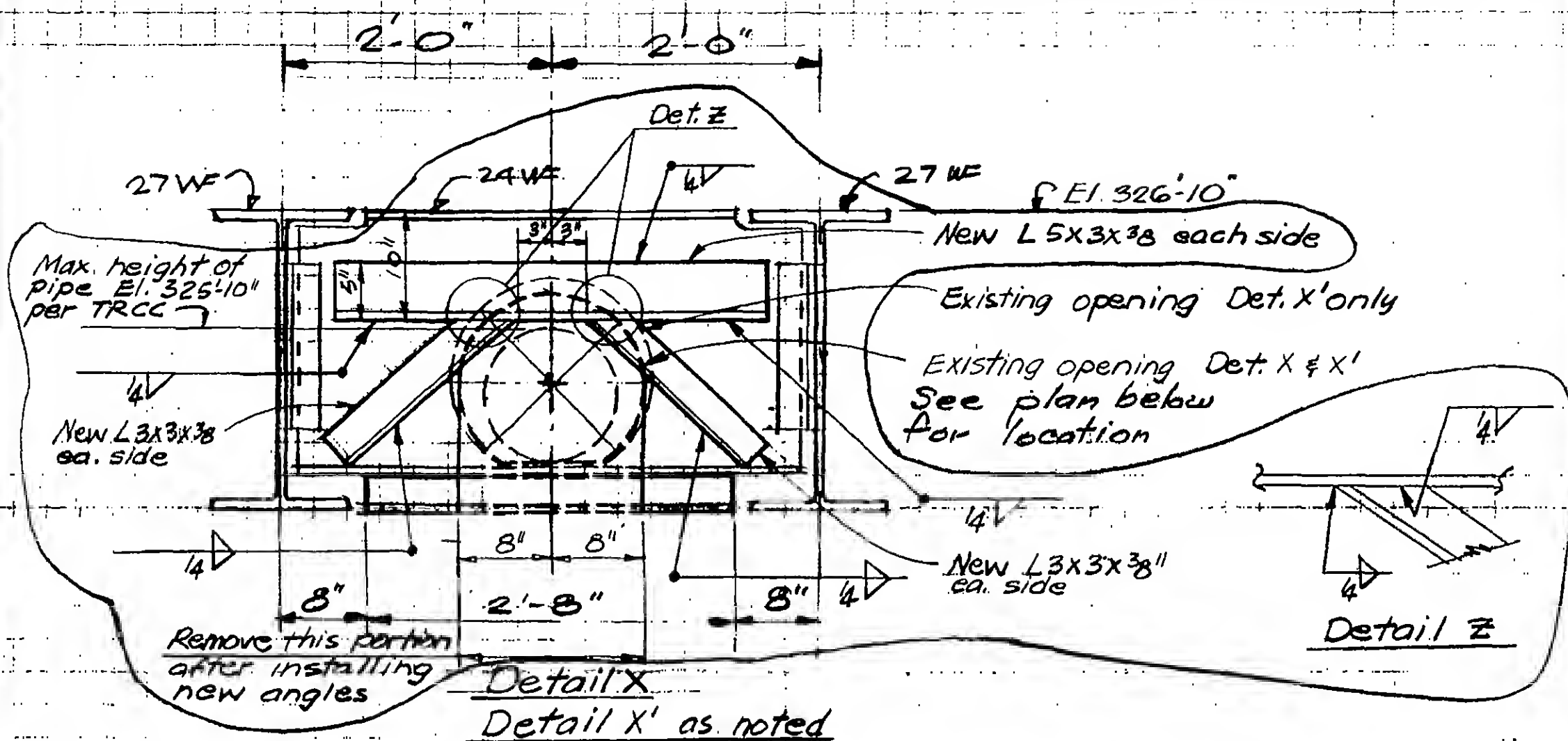
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19-E-2002

REVISIONS

4/10/72

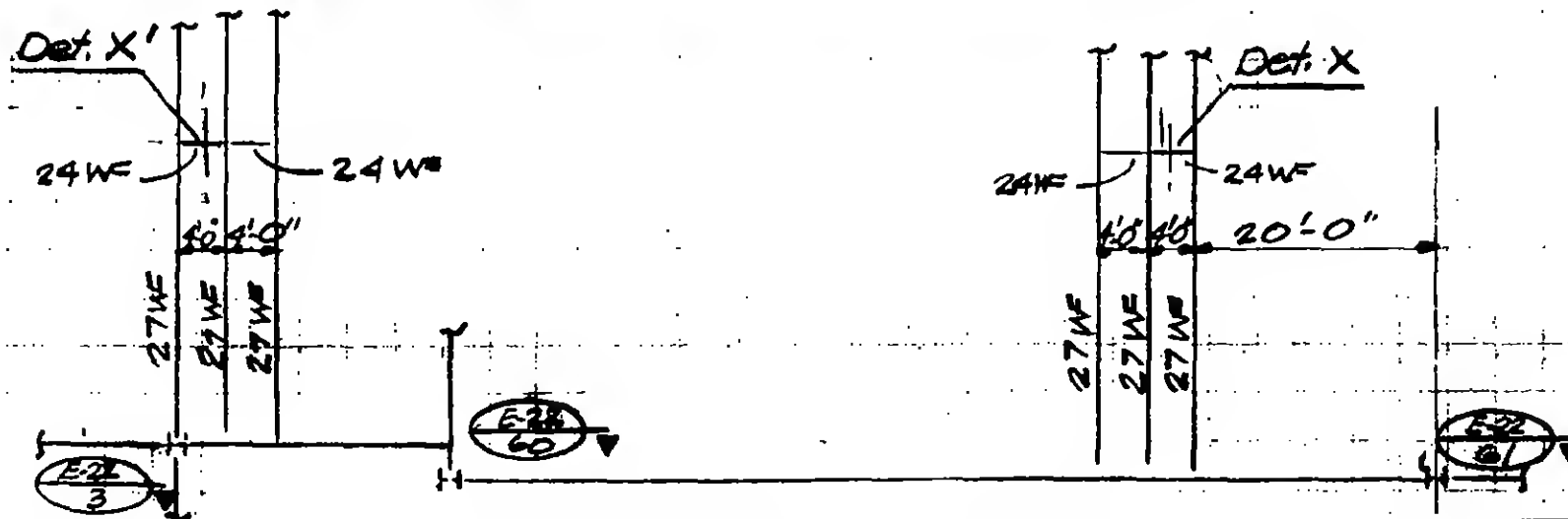
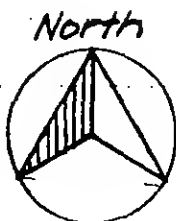
5/24/72



DESIGNED

DRAWN

REVIEWED



19-E-2003

PROJECT

NTC-NORTHEAST PLAZA BLDG

TITLE

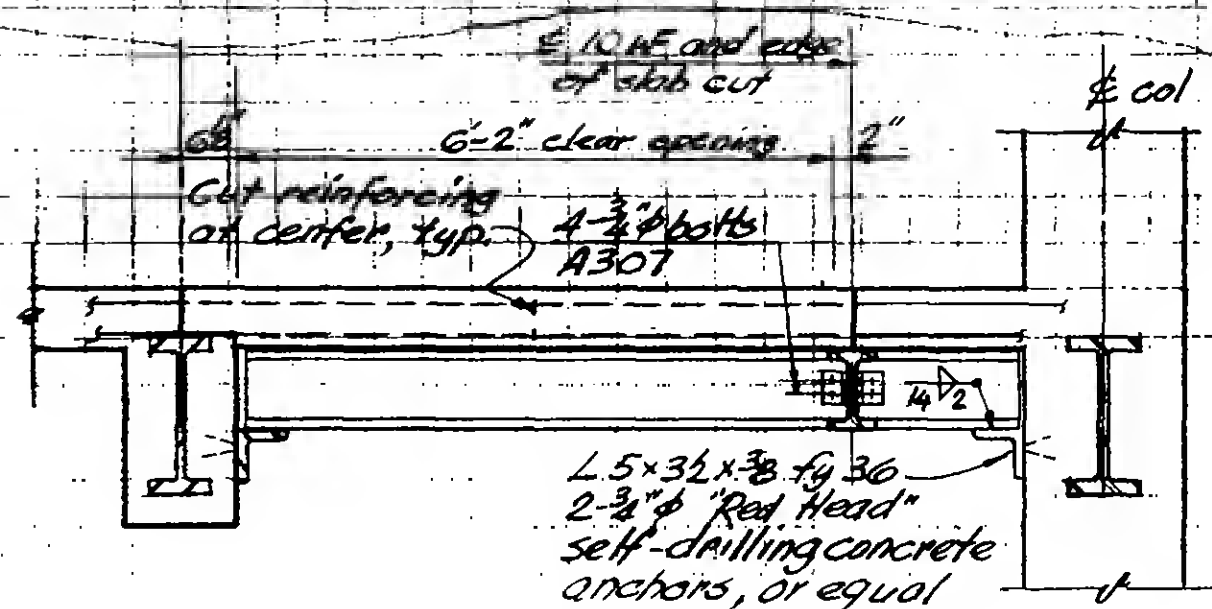
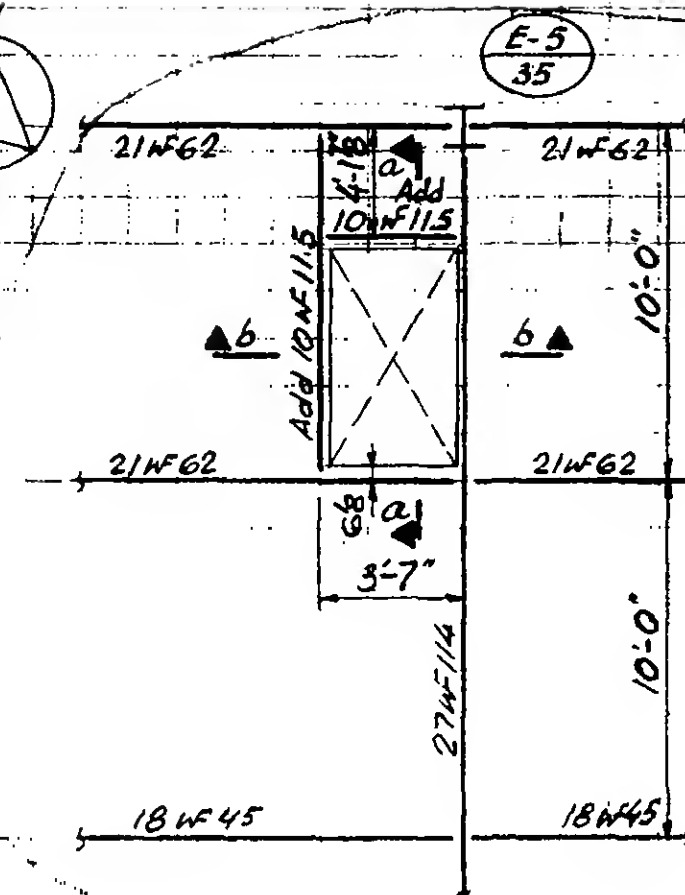
TEMPORARY OPENING

DATE

6/30/71

REVISIONS

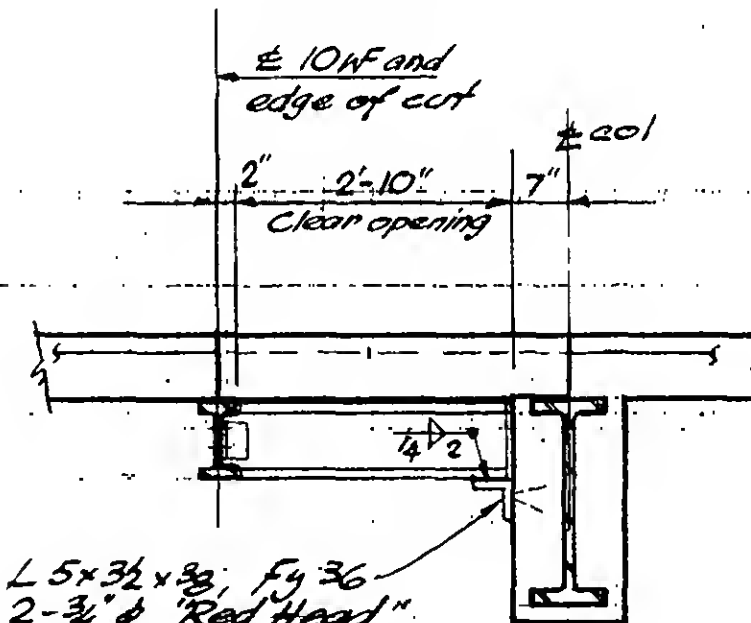
7/9/71



Section a-a

NOTES:

1. Attach seat angles and erect new support beams not more than 1" below the existing slab soffit
2. Drive metal shims not more than 6" on center to obtain uniform bearing between slab and new support beams.
3. Cut temporary slab opening to dimensions shown. Retain as dowels all reinforcing passing through the opening by cutting the reinforcing bars at the center of the opening and bending the bars 90° to lie parallel with the new support beams.
4. To close the opening in the future, bend out all reinforcing, add #4@12x3'-0" T&B in the (E-W) direction, and cast a 6" slab supported on 10WF and 27WF flanges.



Section b-b



DESIGNED

DRAWN

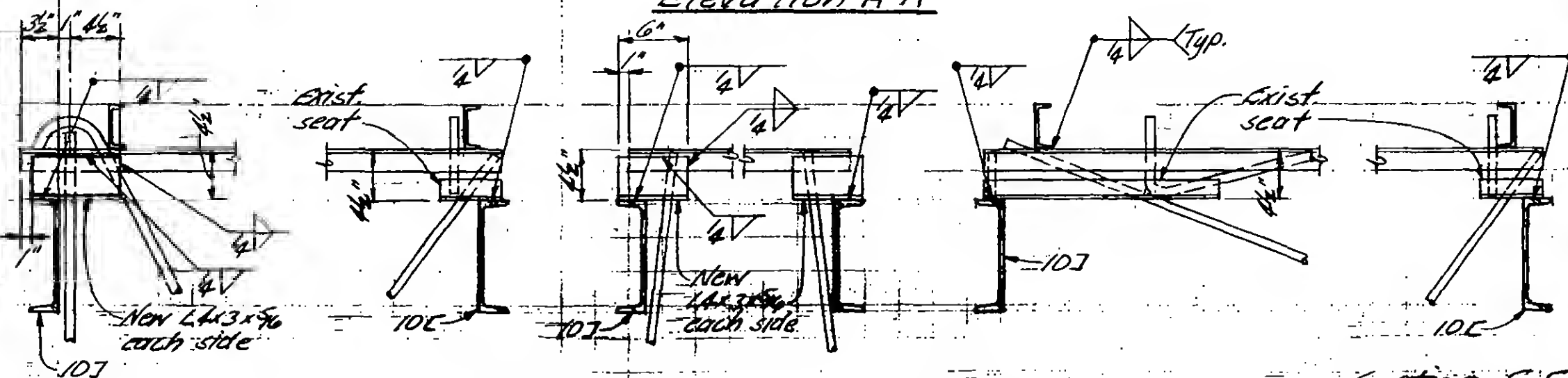
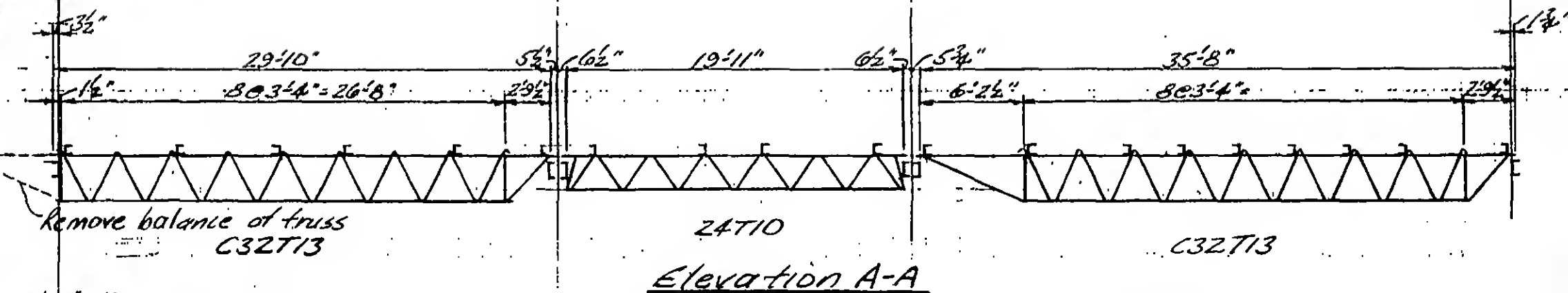
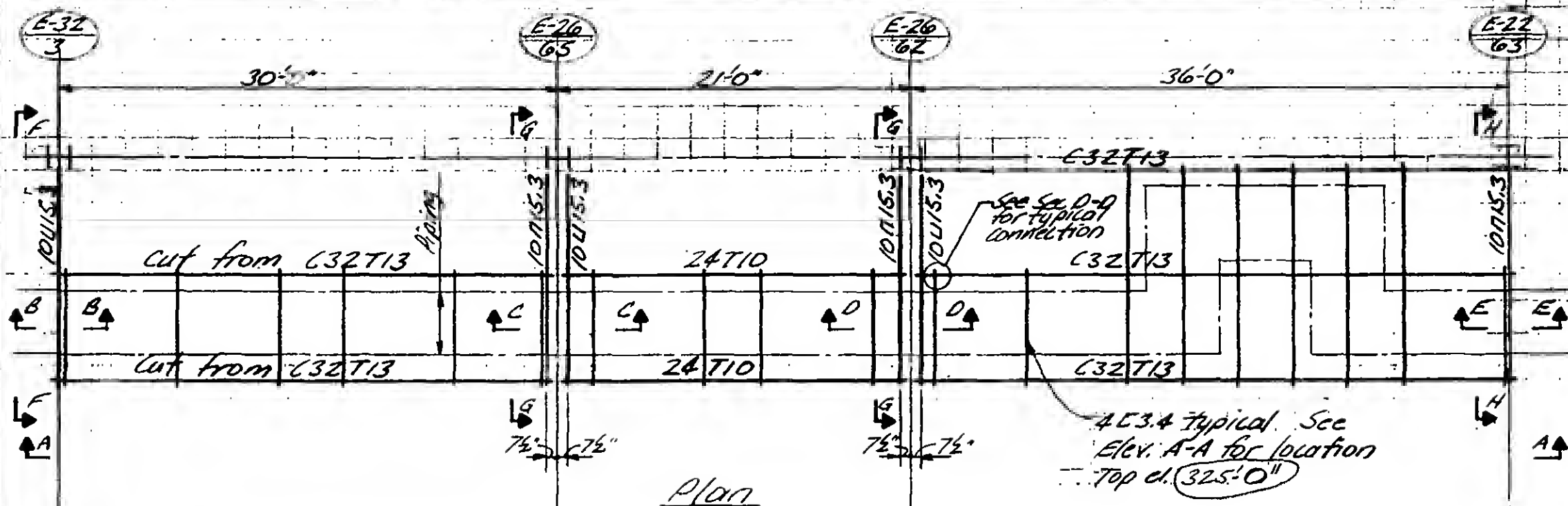
REVIEWED

19-E-2004

PROJECT: THE WORLD TRADE CENTERTITLE: TEMPORARY SUPPORT FOR PIPINGDATE: 7-2-71

REVISIONS

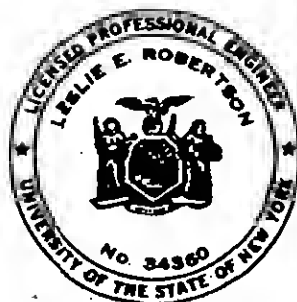
Rev for
Lapelle
Trusses
10-28-71
11/10/71



Section E-E

See 19-E-2005.3 for Notes

19-E-2005.1



DESIGNED

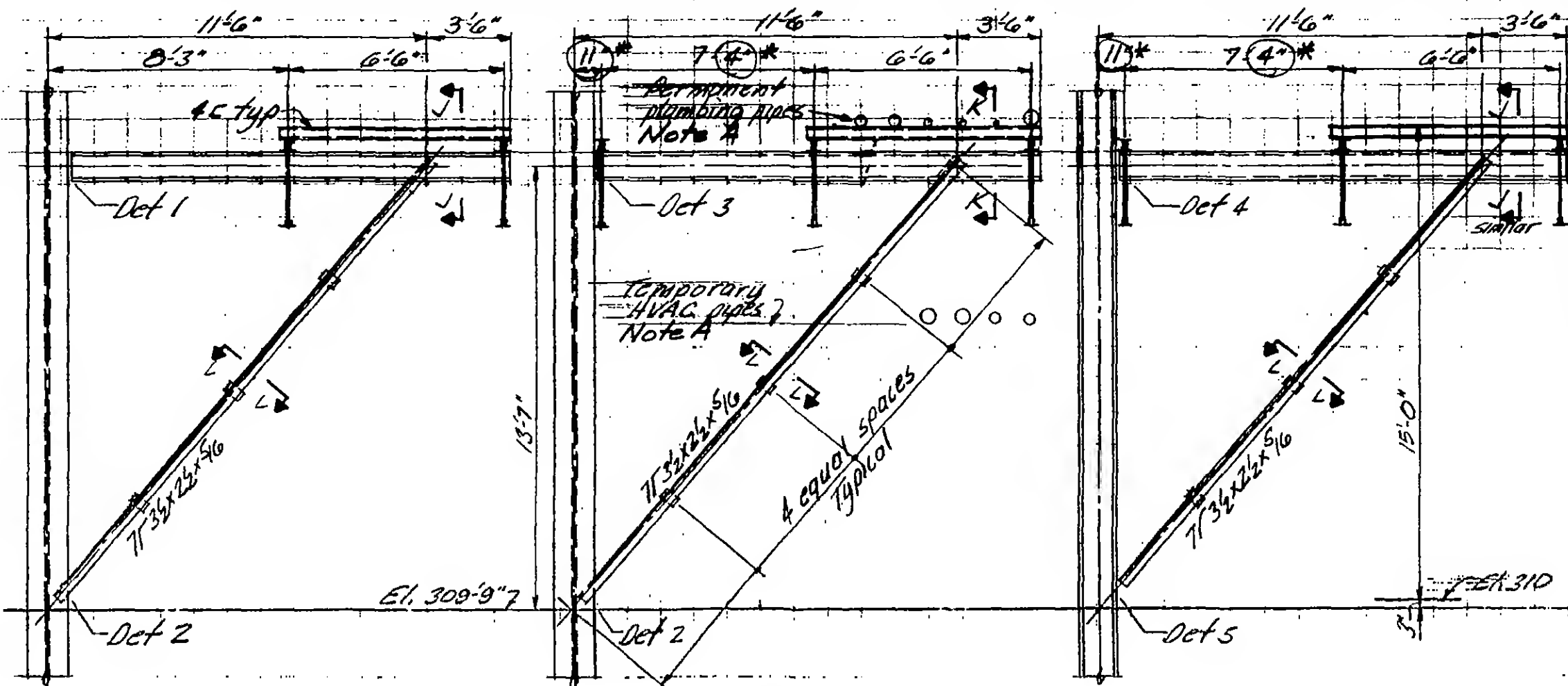
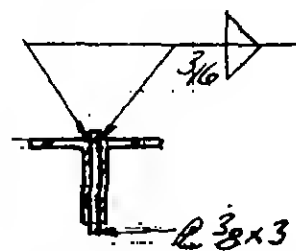
DRAWN

REVIEWED

PROJECT THE WORLD TRADE CENTERTITLE TEMPORARY SUPPORT FOR PIPINGDATE 7/2/71

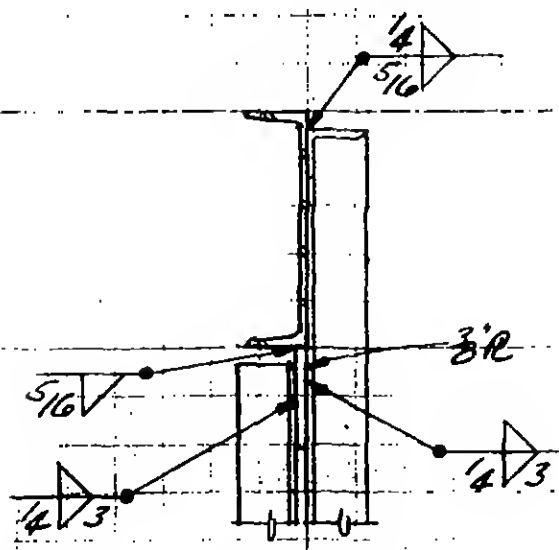
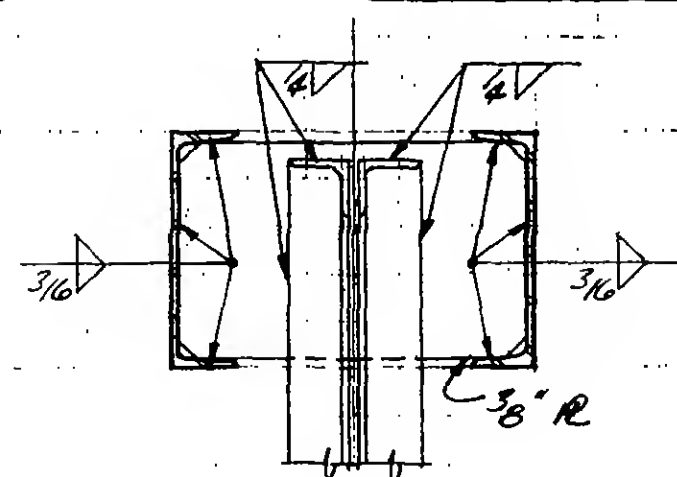
REVISIONS

Rev for
locked
trusses
10/28/71
11/10/71
12/20/71

Section F-FSection G-GSection H-HSection L-L

Note A:
Stagger supports for pipe
to approximately equalize
loading on 4C. Submit
proposed support points
for approval.

* dimensions as measured
in field

Section J-JSection K-K

See 19-E-2005.3 for Notes

19-E-2005.2



DESIGNED

DRAWN

REVIEWED

PROJECT

THE WORLD TRADE CENTER

TITLE

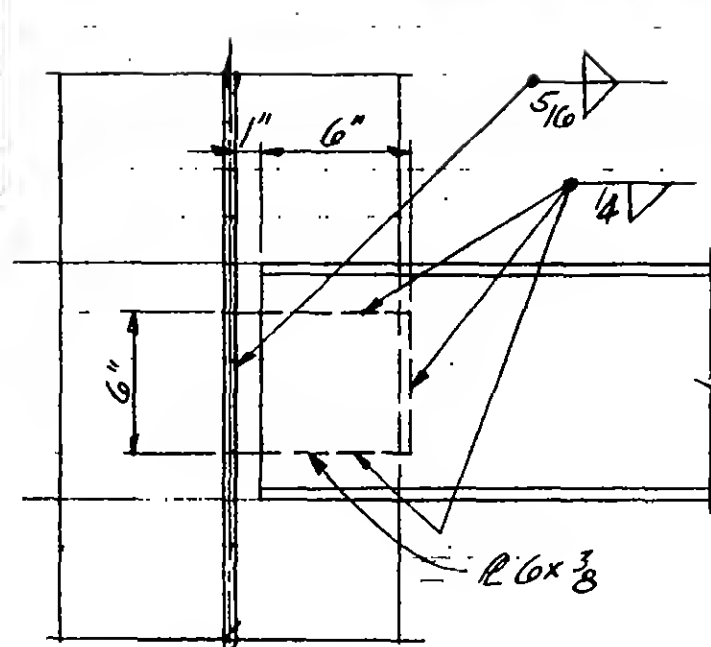
TEMPORARY SUPPORT FOR PIPING

DATE

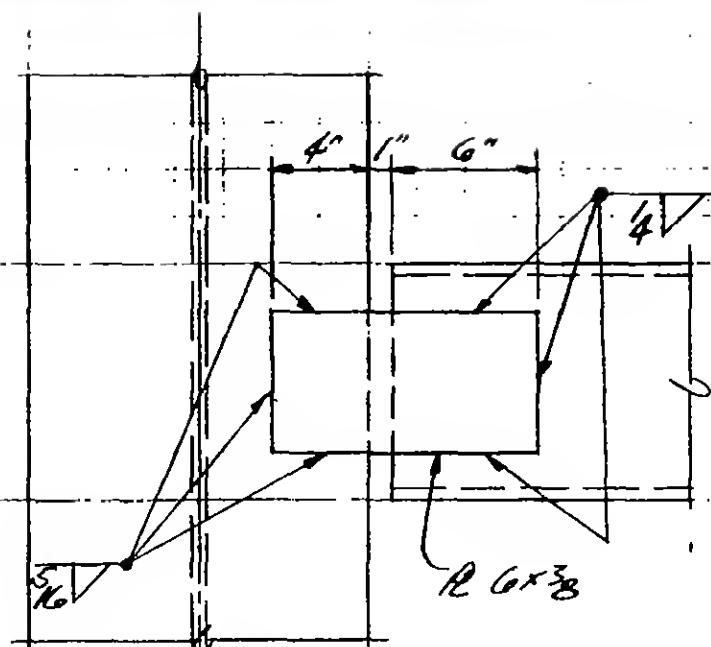
7/2/71

REVISIONS

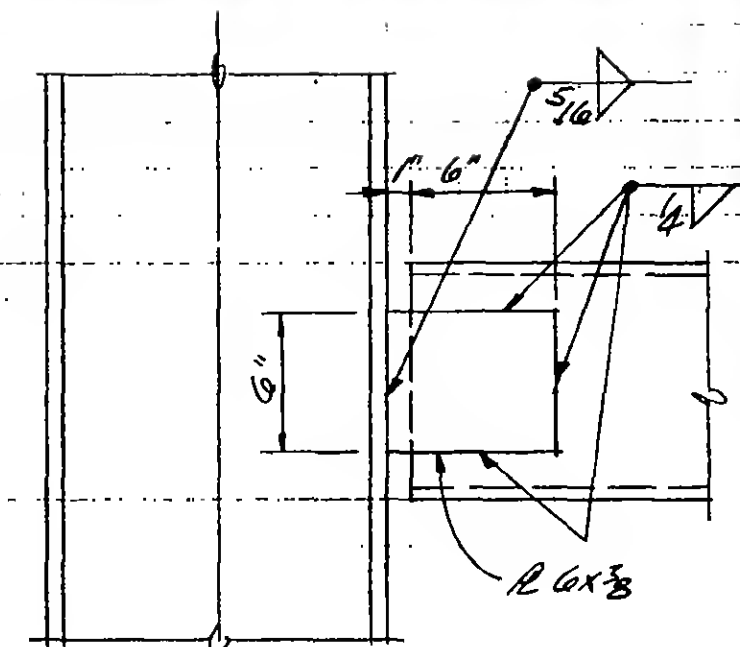
REV. for
Laced
trusses
10/28/71



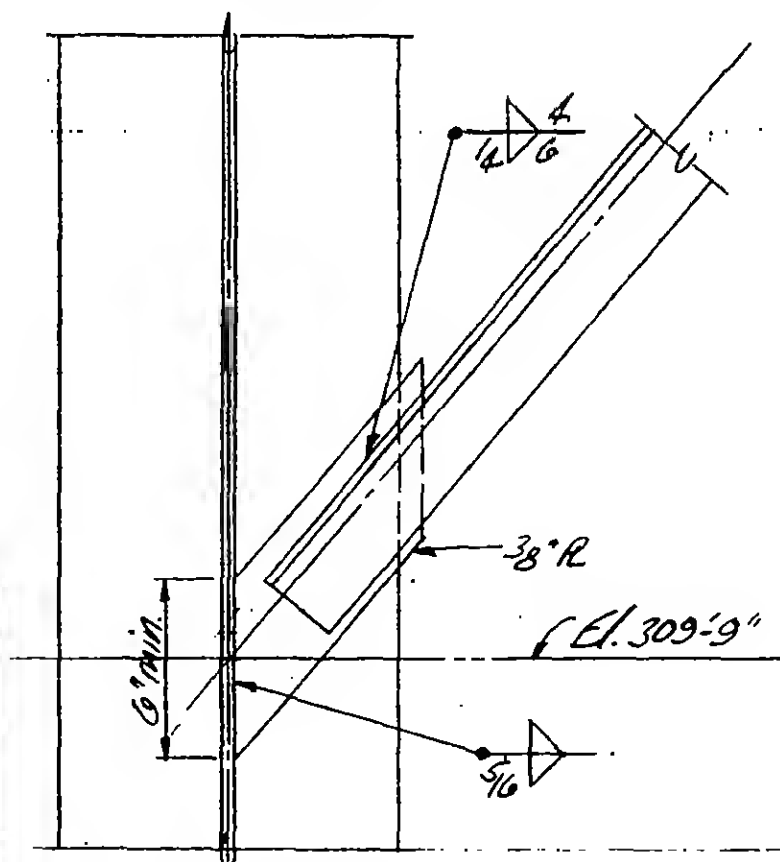
Detail 1



Detail 3



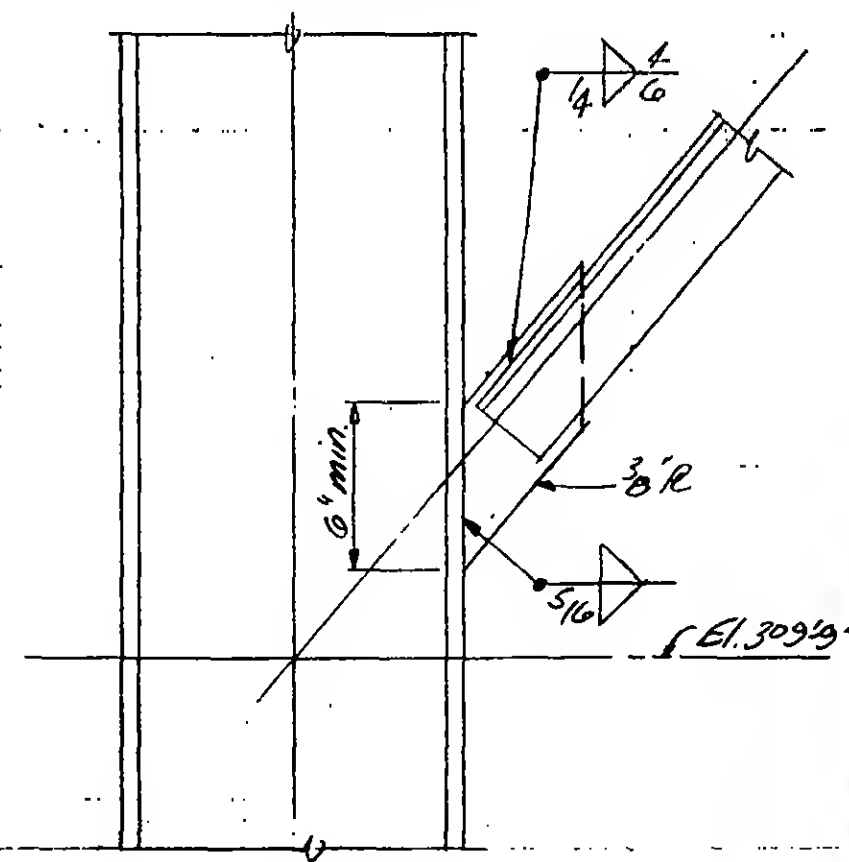
Detail 4



Detail 2

Notes:

1. Trusses indicated C32T13 & 24T10 shall be laced surplus trusses now stored at KRE-Carteret plant.
2. All new steel shall be ASTM-A36.
3. All welds shall be made using E70XX low hydrogen electrodes.



Detail 5



DESIGNED

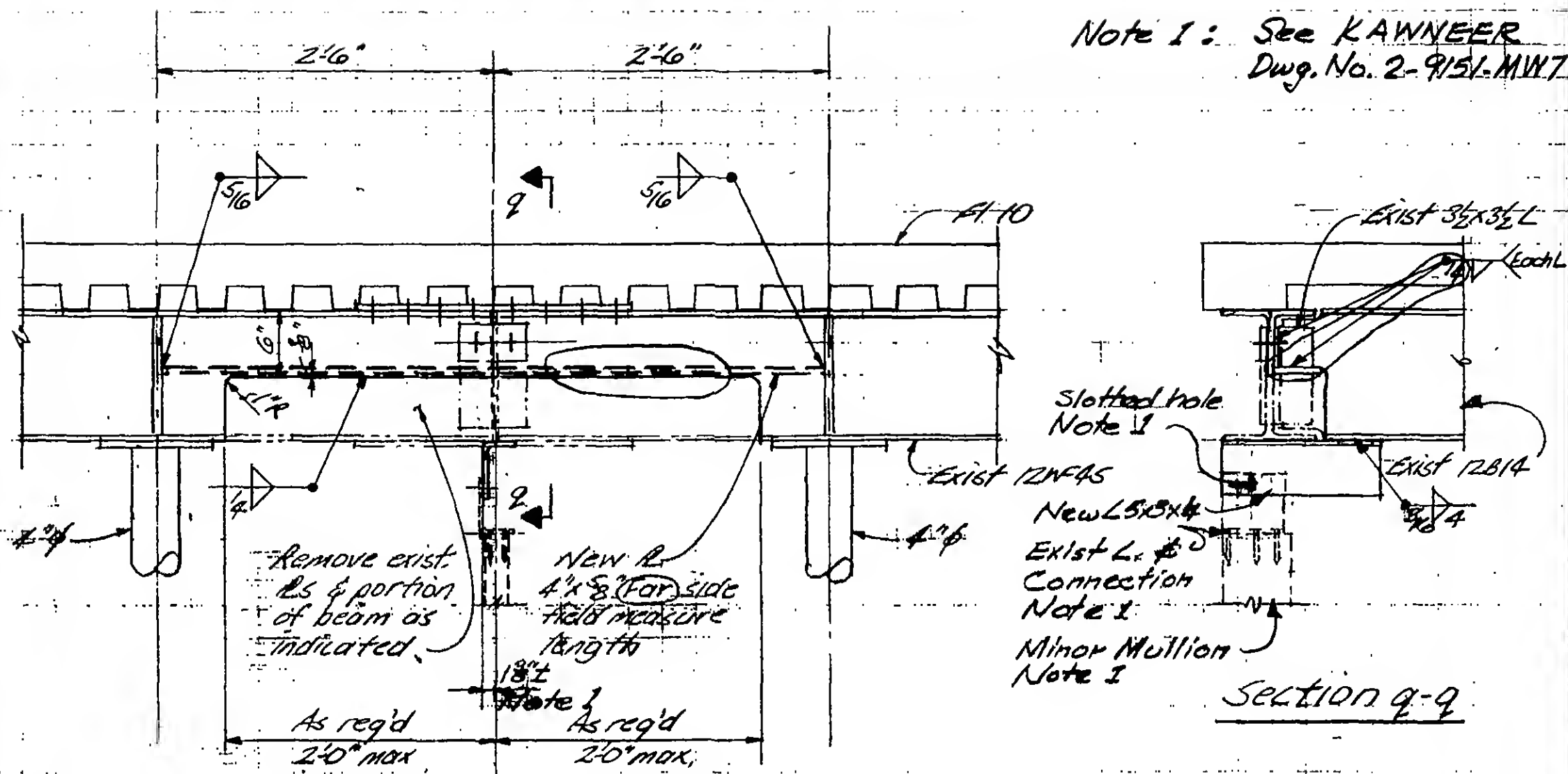
DRAWN

REVIEWED

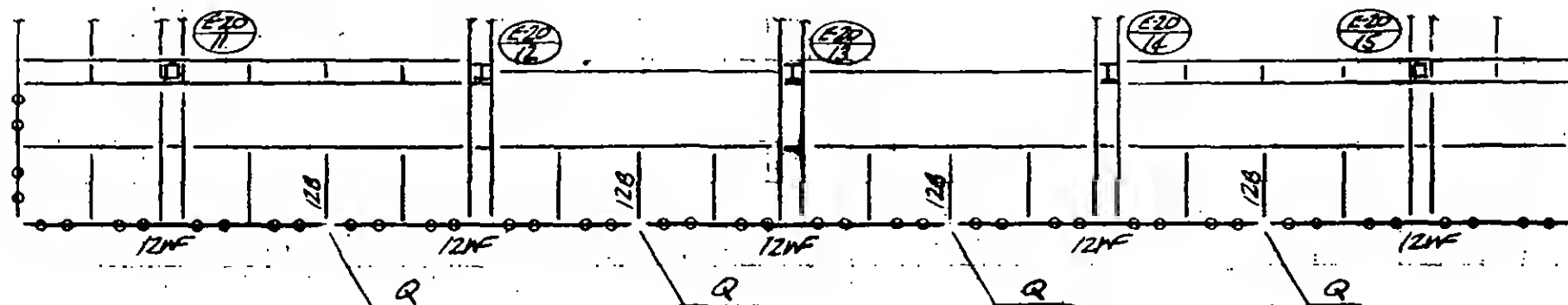
REVISIONS

1029/71

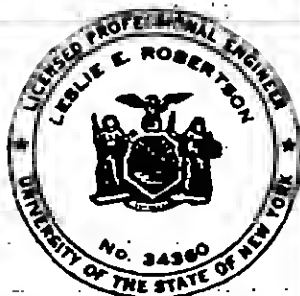
12/9/71



Detail Q



Key Plan



DESIGNED

DRAWN

REVIEWED

19-E-2006

EDITIONS

VL-1-76

2-22
60

1 of new oppo

1.7"

of existing 22" opng

EA 326-10

E1.325'-0"

Add reinf.
R (typ.)

Existing
stiff. R.

Existing
reinf. #
(typ.)

Add weld
Existing weld

Symm. about ε

pushing buds

$\phi 11 \times 1$ each side

Section a-a

GIRDER ELS

ENLARGED OPENING 2007A

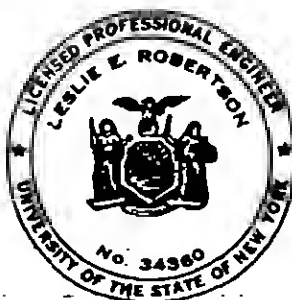
Notes:

1. All new steel to be ASTM-A36.
2. All welds to be made with E70xx low hydrogen electrodes.
3. Complete installation of all new plates before cutting opening.

Key Plan El. 332'

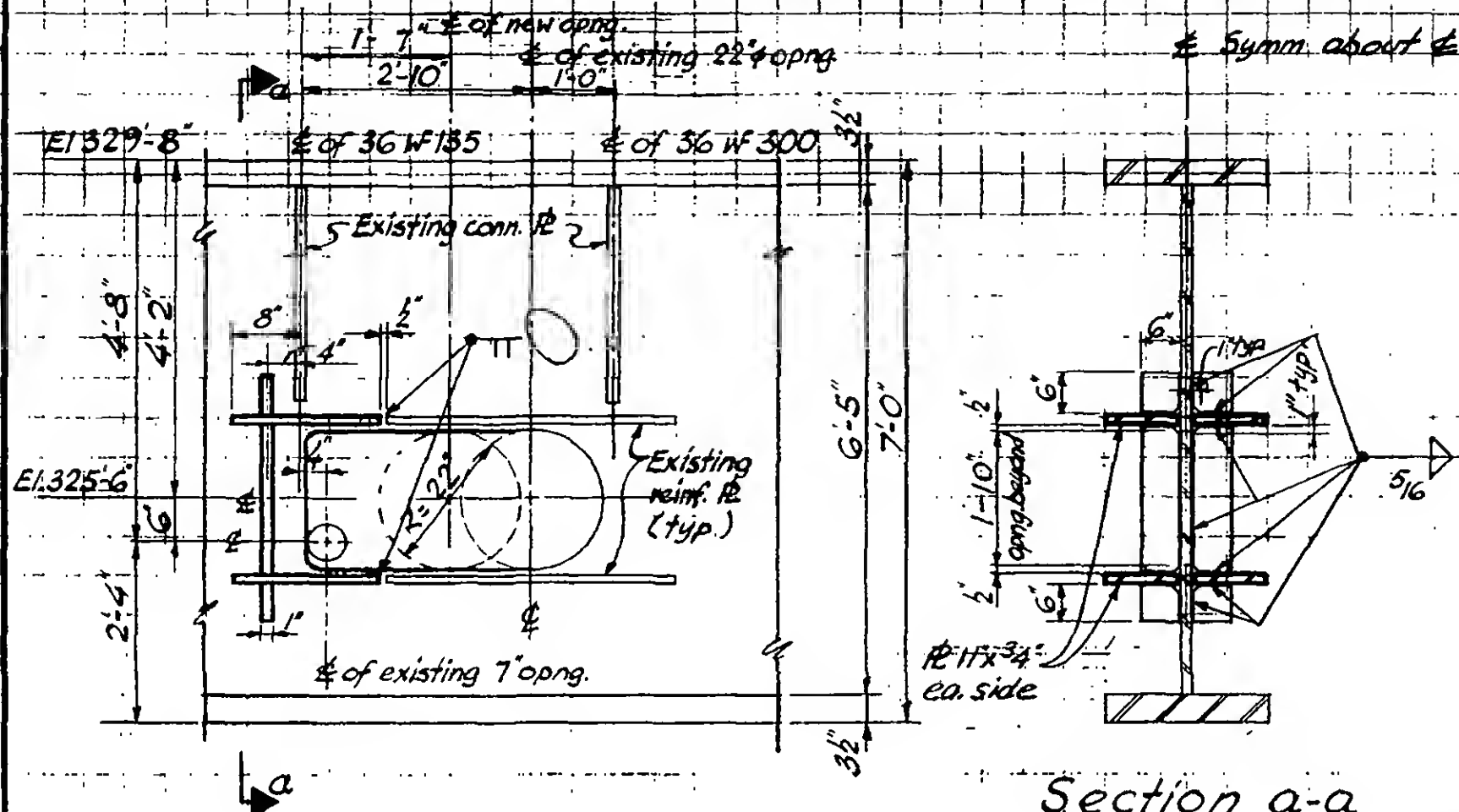
NE Bldg. Ref. Dwg. SNE-8

E-2007.1

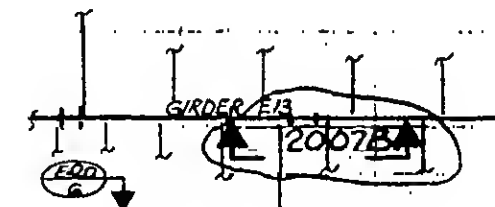


REVISIONS

11-1-71



Section a-a



ENLARGED OPENING 2007.B

Notes:

1. All new steel to be ASTM-A36.
2. All welds to be made with E70xx low hydrogen electrodes.
3. Complete installation of all new plates before cutting opening.



DESIGNED

DRAWING

J. Gricius

REVIEWER

Key Plan E1.332

NE BTdg. Ref. Dwg. SNE-8

GIRDER EA

19-E-2007.2

PROJECT

THE WORLD TRADE CENTER

TITLE

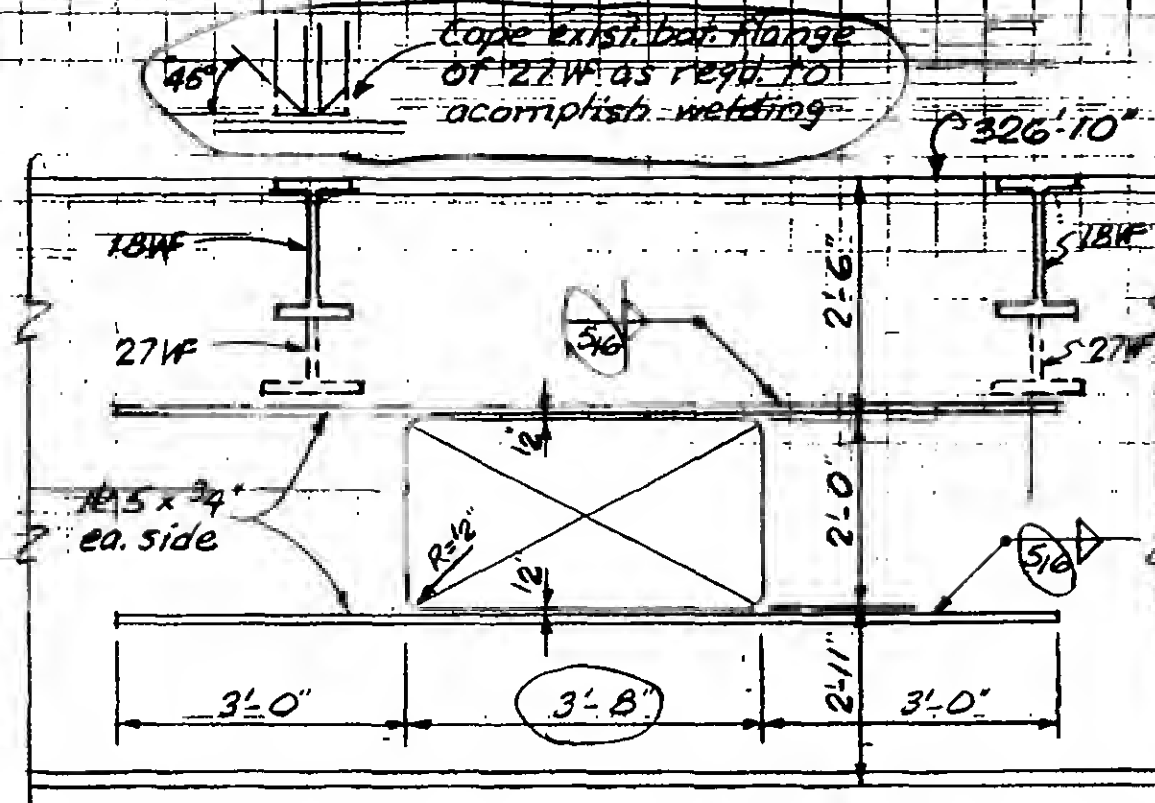
OPENING THRU BEAMS AT EL 332' 0"

DATE _____

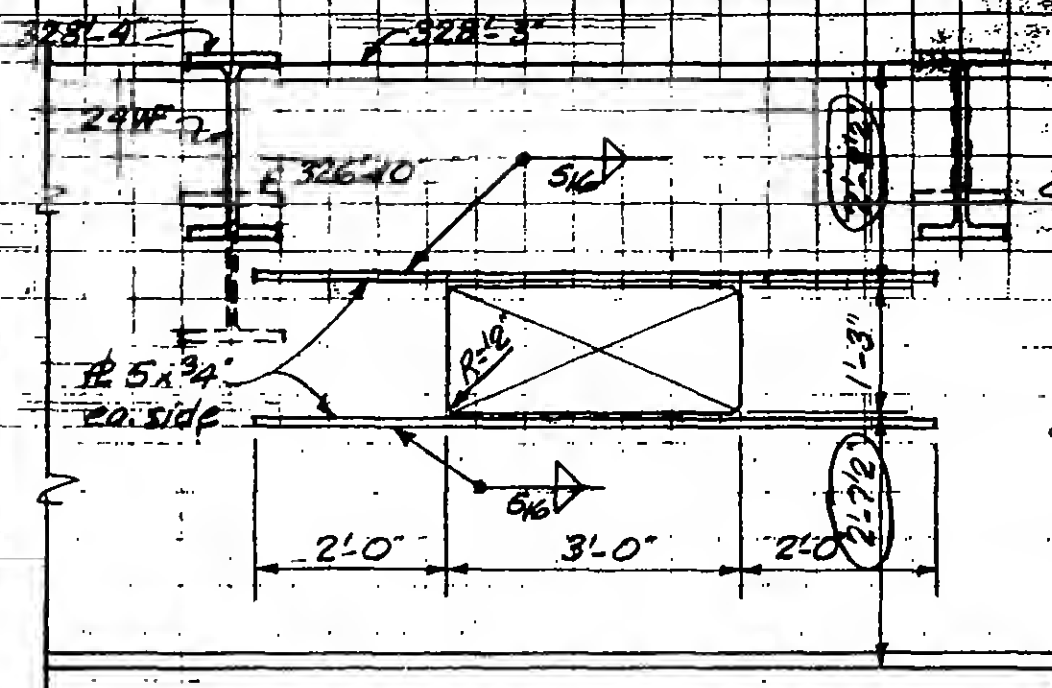
7-26-72

REVIEWS

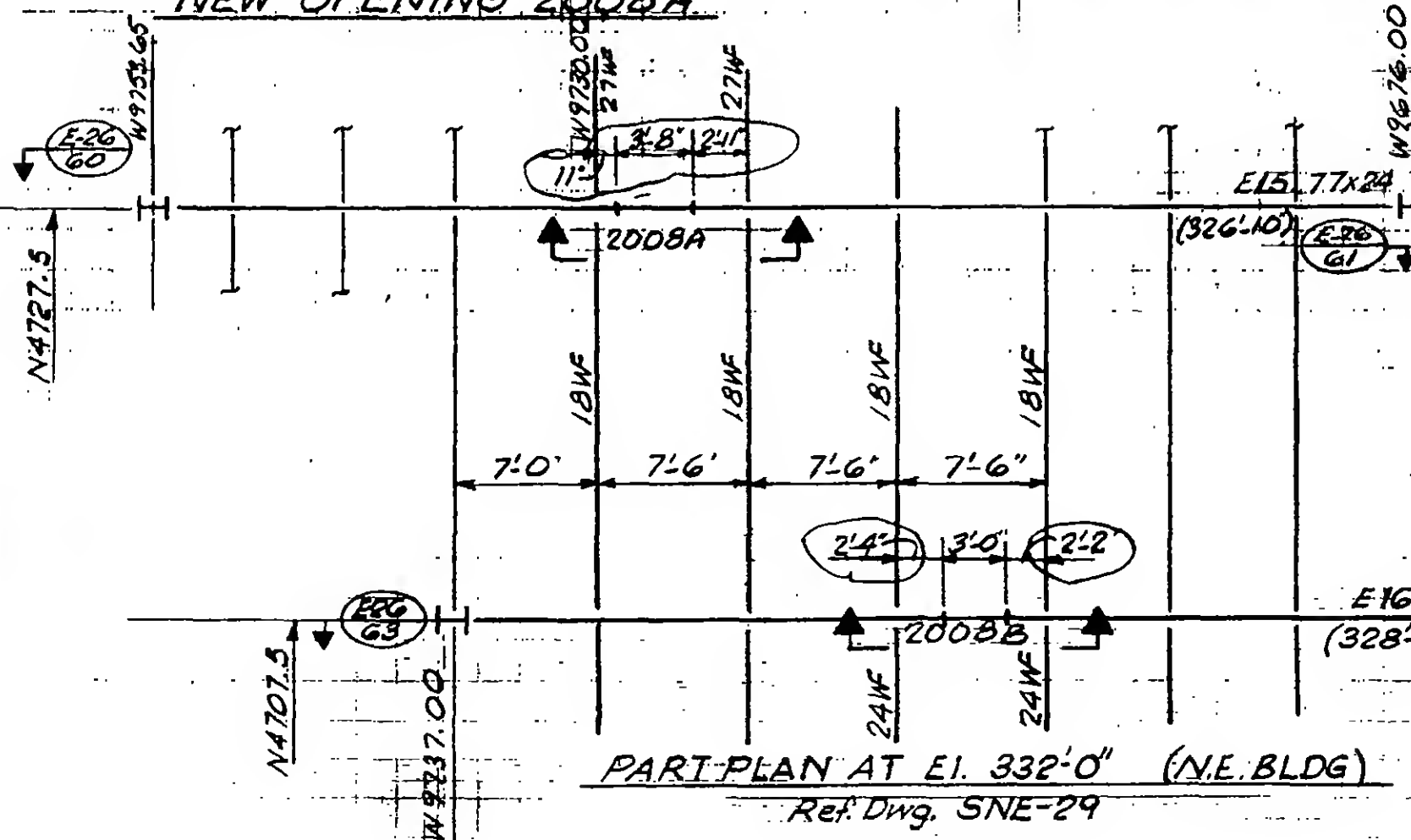
11-1-71



NEW OPENING 2008A



NEW OPENING 2008B



Notes

1. All new steel to be ASTM - A36.
2. All welds to be made with E70xx low hydrogen electrodes.
3. Complete installation of all new plates before cutting opening.

NORTH



DESIGNED

DRAW

D. Chew

REVIEWED

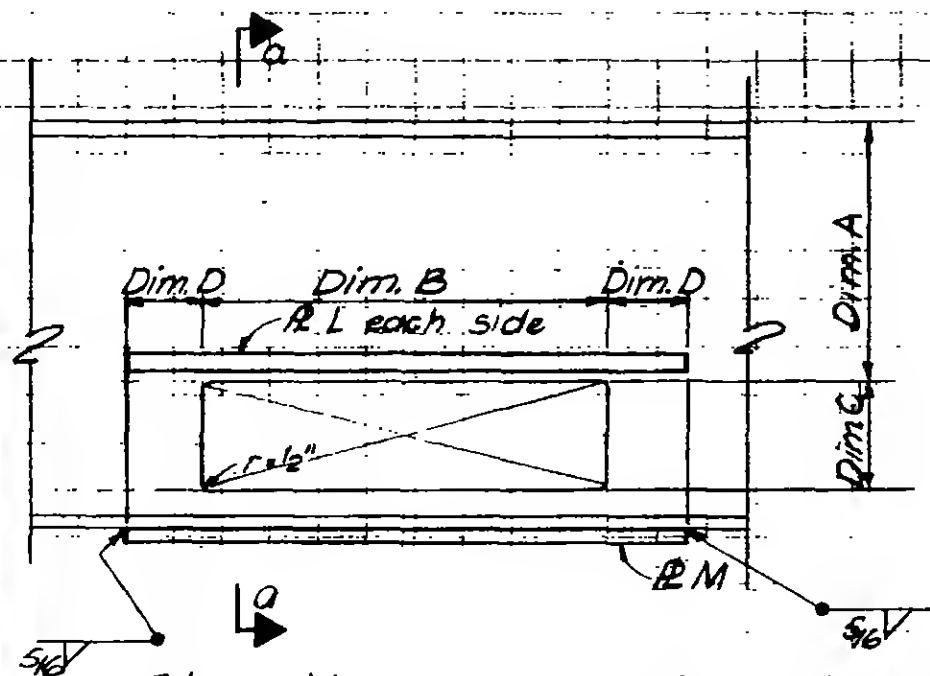
PART PLAN AT EL. 332'-0" (N.E. BLDG)

Ref. Dwg. SNE-29

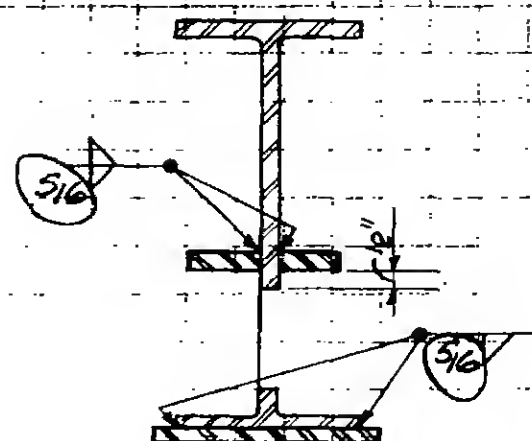
19-E-2008

REVISIONS

11-1-71



Elevation of New Beam Opening



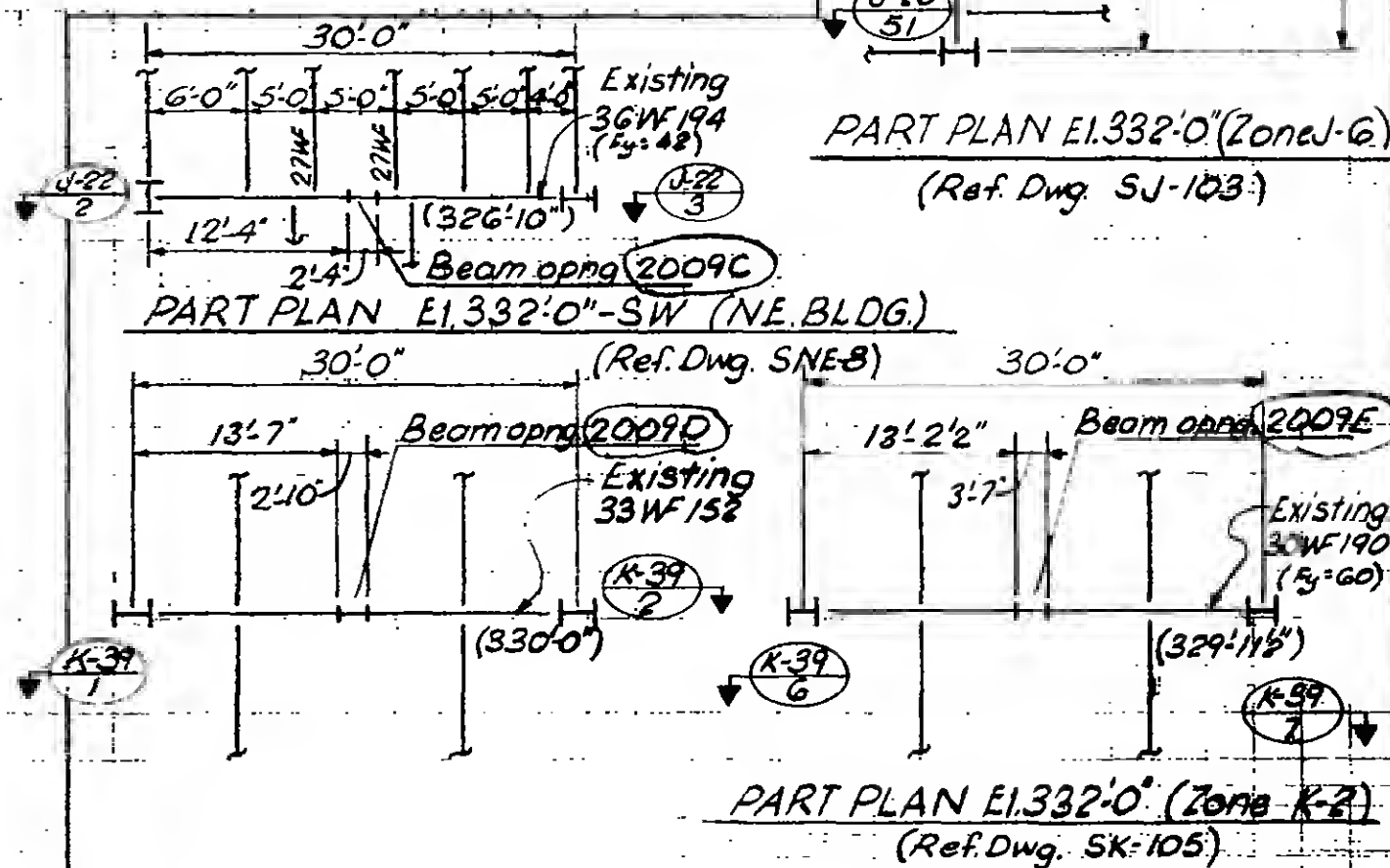
Section a-a

| SCHEDULE | | | | | | |
|----------|-------------|-----------|-----------|--------|--------|-------|
| Beam | R | | Dim. | | | |
| opng. | L | M | A | B | C | D |
| 2009A | 5"x3 1/4" | (13"x58") | 1'-3" | 2'-8" | 1'-0" | 2'-0" |
| 2009B | * | (13"x58") | 1'-3" | 2'-4" | 1'-0" | 2'-0" |
| 2009C | (5"x3 1/4") | 13"x58" | 1'-7" | 2'-4" | 1'-2" | * |
| 2009D | 5"x3 1/4" | (13"x58") | 1'-9 1/2" | 2'-10" | 0'-9" | 2'-0" |
| 2009E | (5"x3 1/4") | (13"x58") | 1'-5" | 3'-7" | 0'-10" | 2'-0" |

* { 2'-0" Plate L South side
1'-0" Plate L North side
2'-0" Plate M

Notes:

1. All new steel to be ASTM-A36.
2. All welds to be made with E70XX low hydrogen electrodes.
3. Complete installation of all new plates before cutting opening.



PART PLAN E1.332'-0" (Zone J-6)
(Ref. Dwg. SJ-103)

PART PLAN E1,332'-0"-SW (NE BLDG.)
30'-0" (Ref. Dwg. SNE-8)

PART PLAN E1.332-0° (Zone K-2)
(Ref. Dwg. SK-105)

19-E-2009



重要事項

CHIANG

BRAWN

TR

778

PROJECT

THE WORLD TRADE CENTER

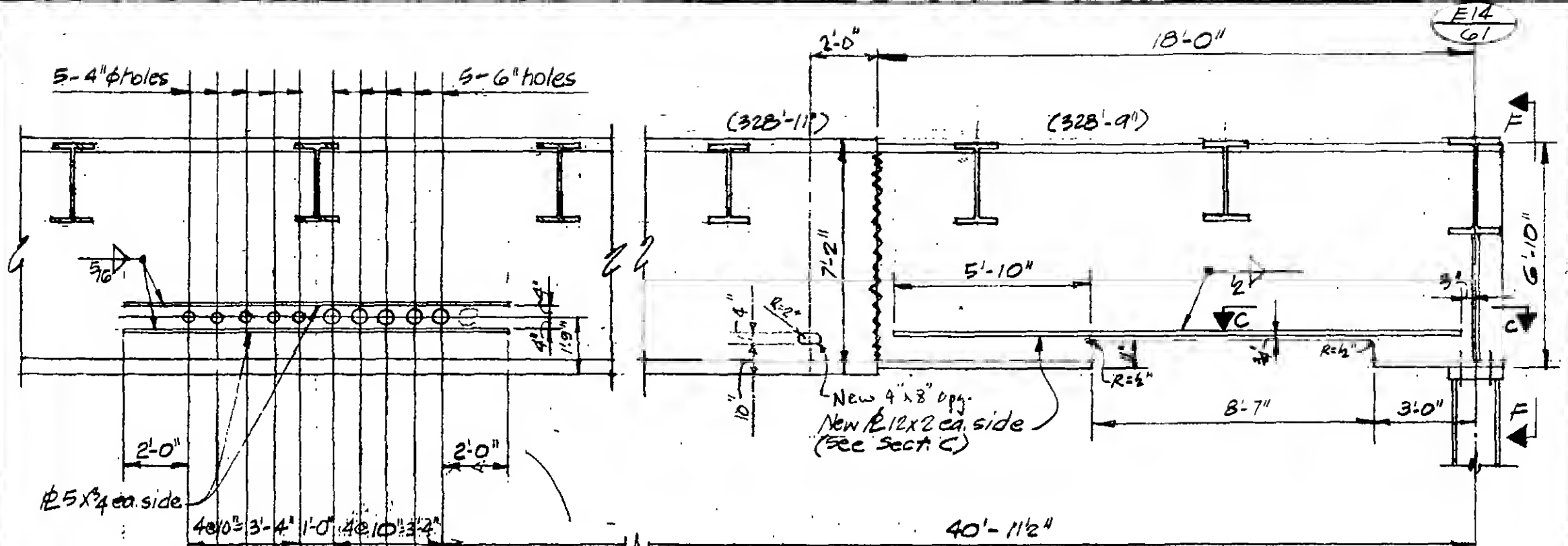
TITLE

BEAM OPENINGS AT ELEVATION 332.

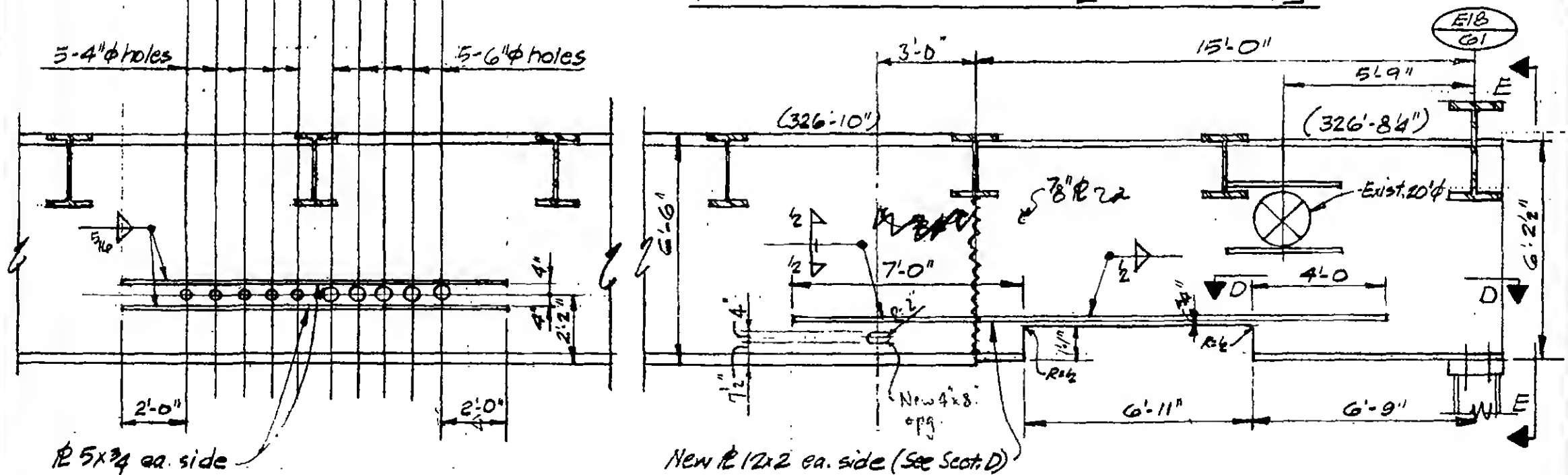
DATE

11-1-71

REVISIONS



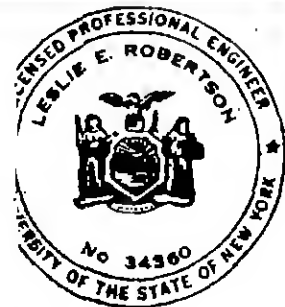
ELEVATION 2010A [GIRDER E11]



ELEVATION 2010B [GIRDER E12]

See 19-E-2010.2 for Notes & Key Plan.

19-E-2010.1



SHED

DRAWN
P. Ordi
REVIEWED

PROJECT

THE WORLD TRADE CENTER

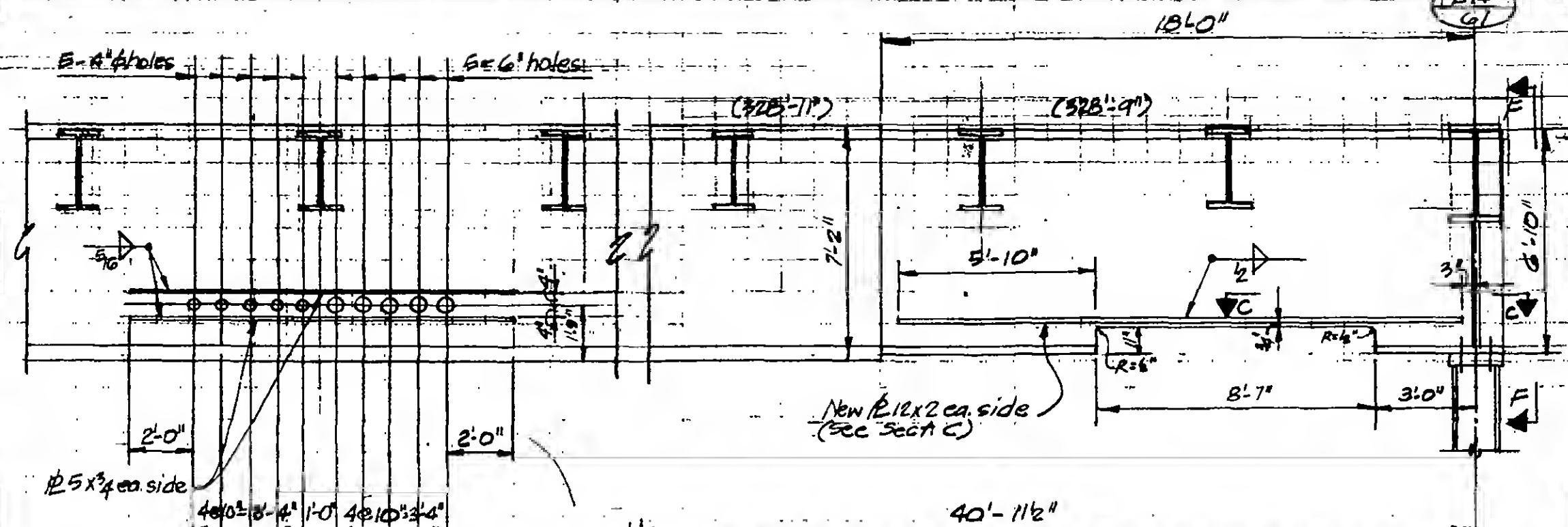
TITLE

BEAM OPENINGS AT ELEVATION 382

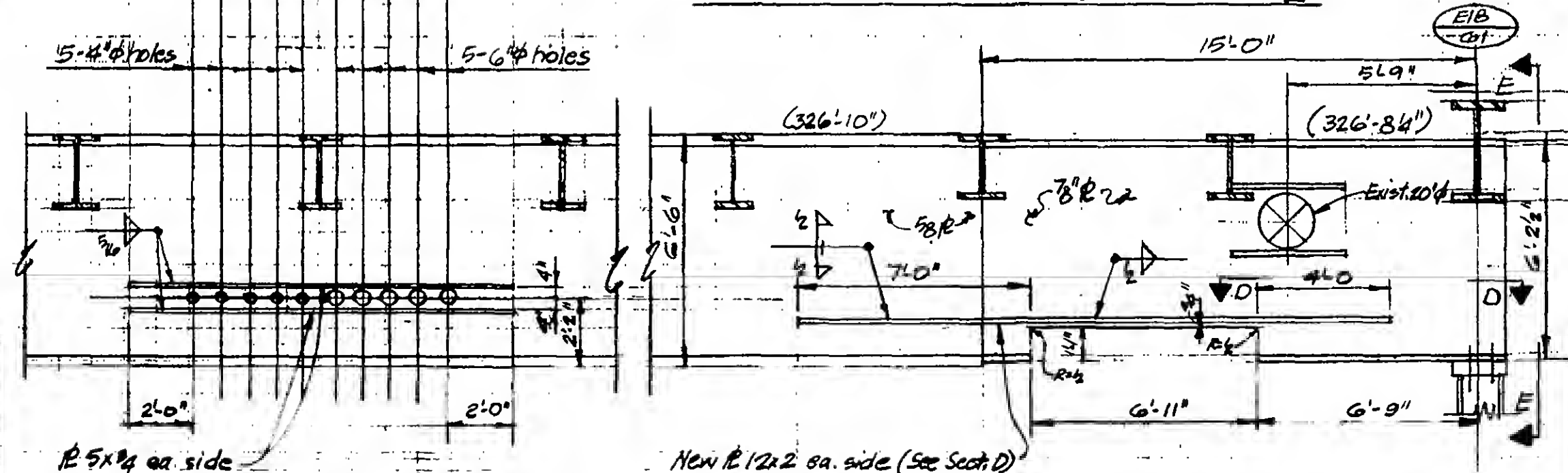
DATE

11-1-71

REVISIONS



ELEVATION 2010A [GIRDER E11]



ELEVATION 2010B [GIRDER E12]

See 19-E-2010.2 for Notes & Key Plan.

19-E-2010.1



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DRAWN

P. Orick

REVIEWED

PROJECT

THE WORLD TRADE CENTER

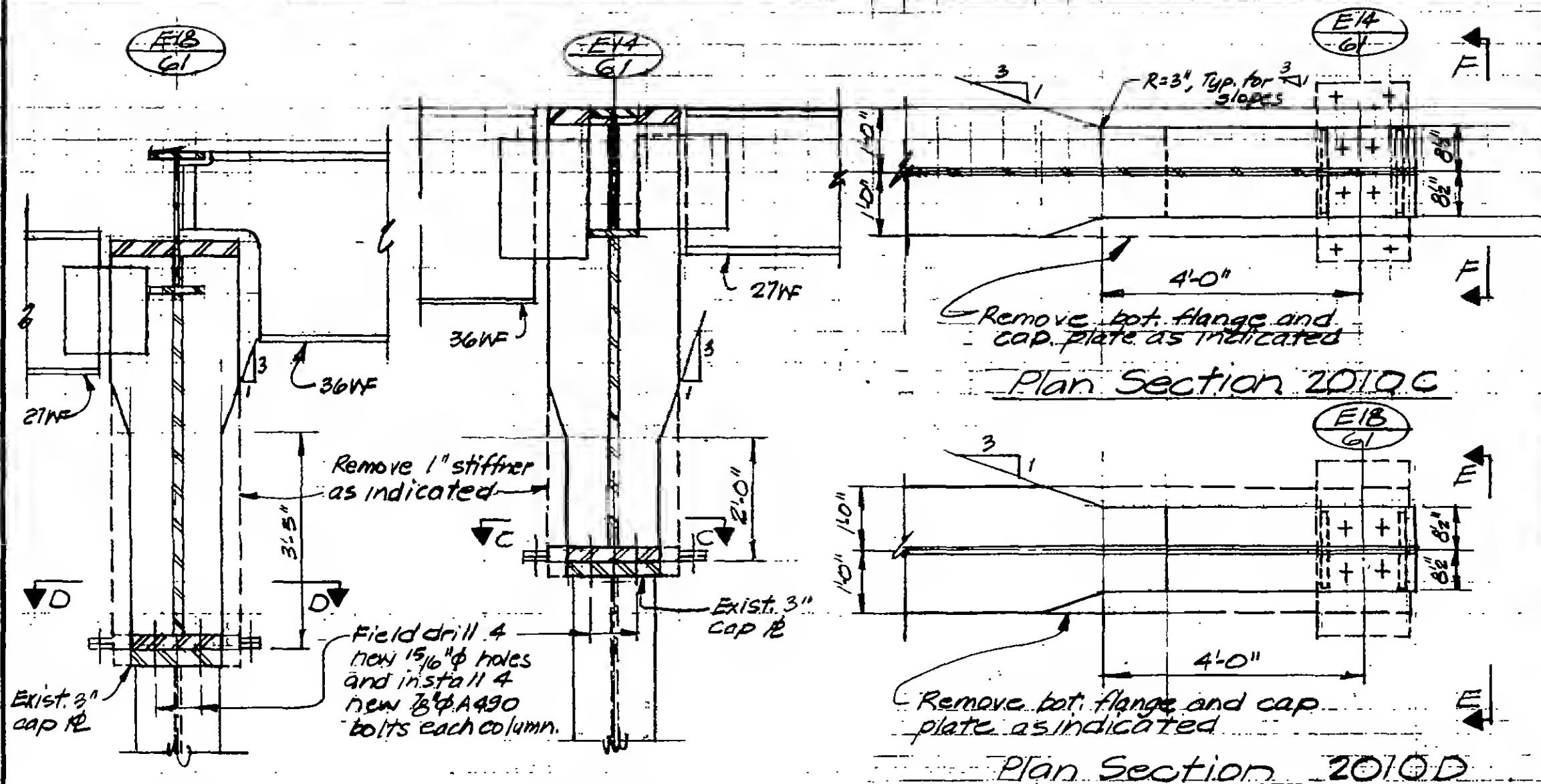
TITLE

BEAM OPENINGS AT ELEVATIONS 332

DATE

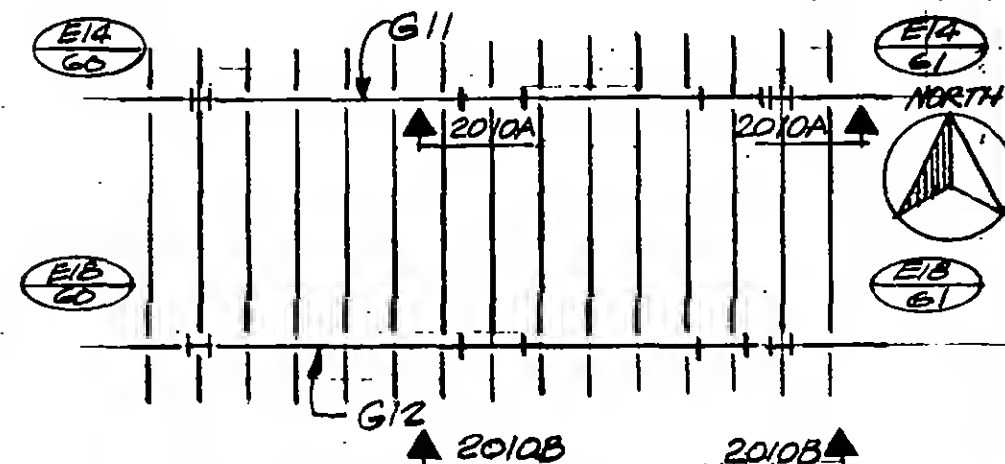
11-1-71

REVISIONS



Notes:

1. All new material to be ASTM A36.
2. All weld to be made with E70xx low hydrogen electrodes.
3. Complete installation of new plates and bolts prior to cutting existing material.
4. Smoothness of gas cut edges shall be ASA 500 or smoother.

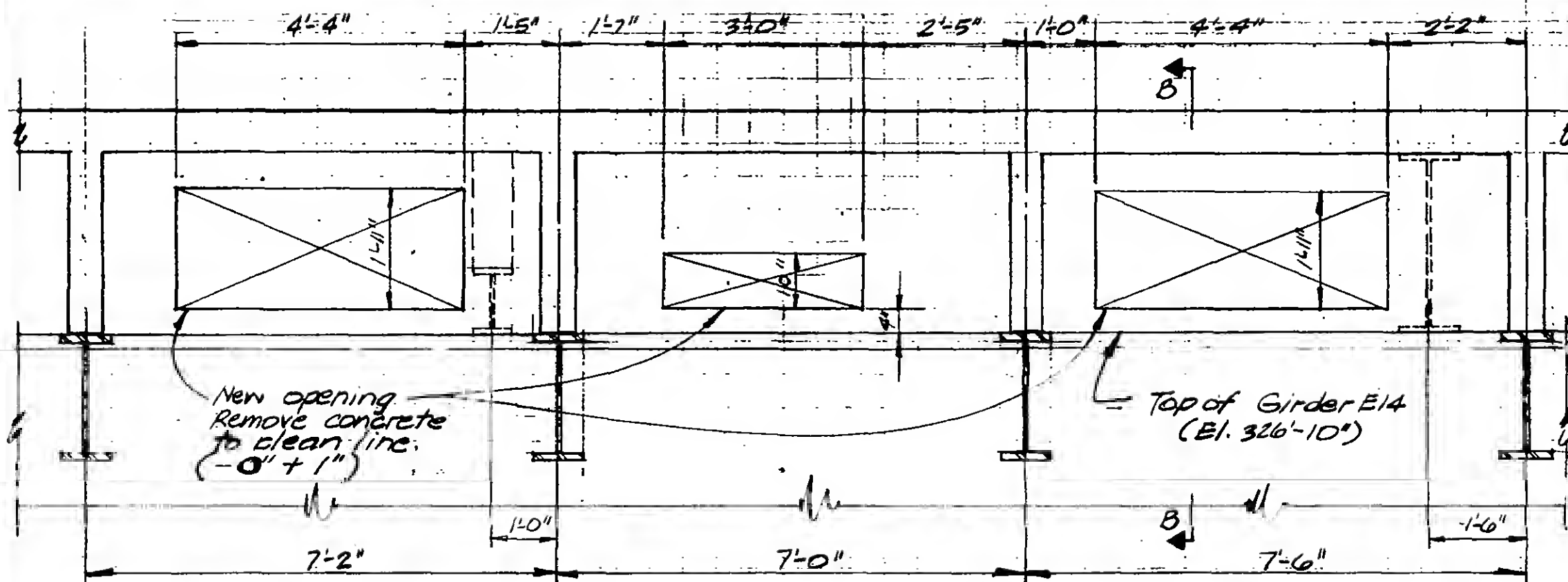


DESIGNED

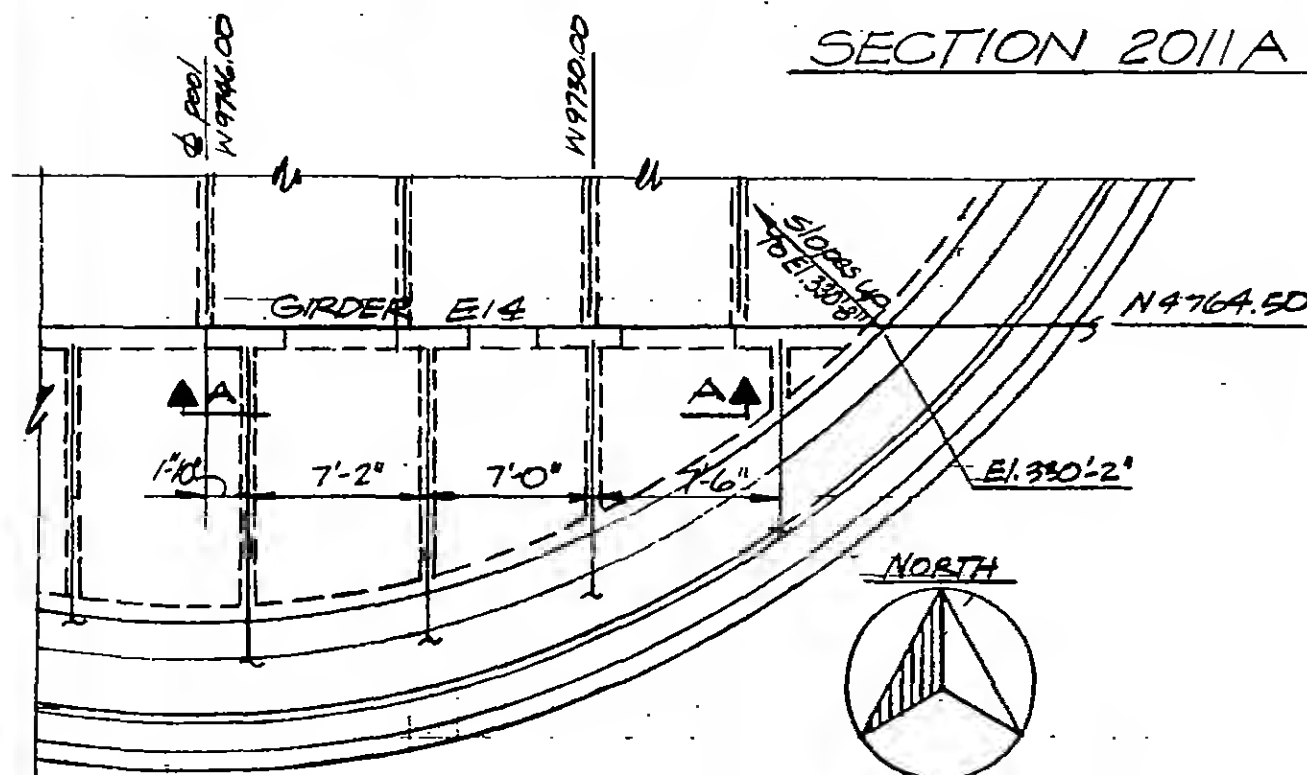
DRAWN

REVIEWED

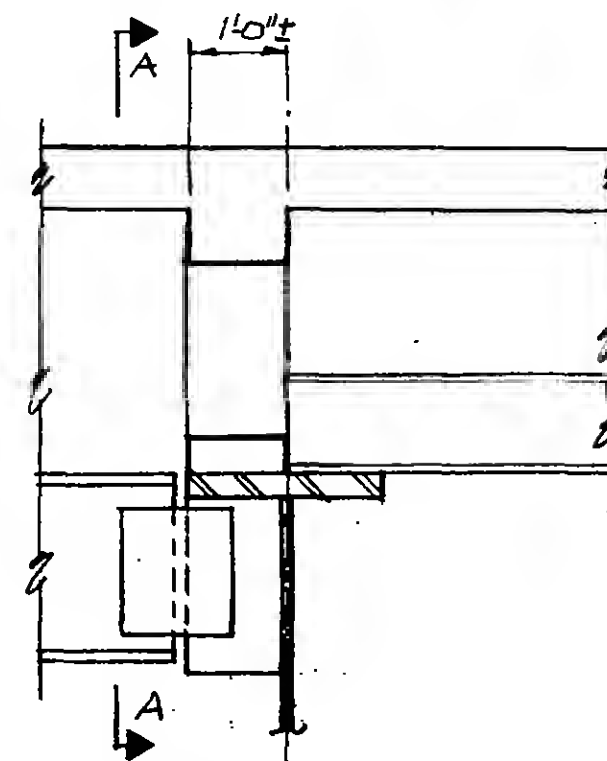
REVISIONS



SECTION 2011A



KEY PLAN



SECTION 2011B



DESIGNED

DRAWN
P.M. Oester

REVIEWED

19-E-2011

PROJECT

THE WORLD TRADE CENTER

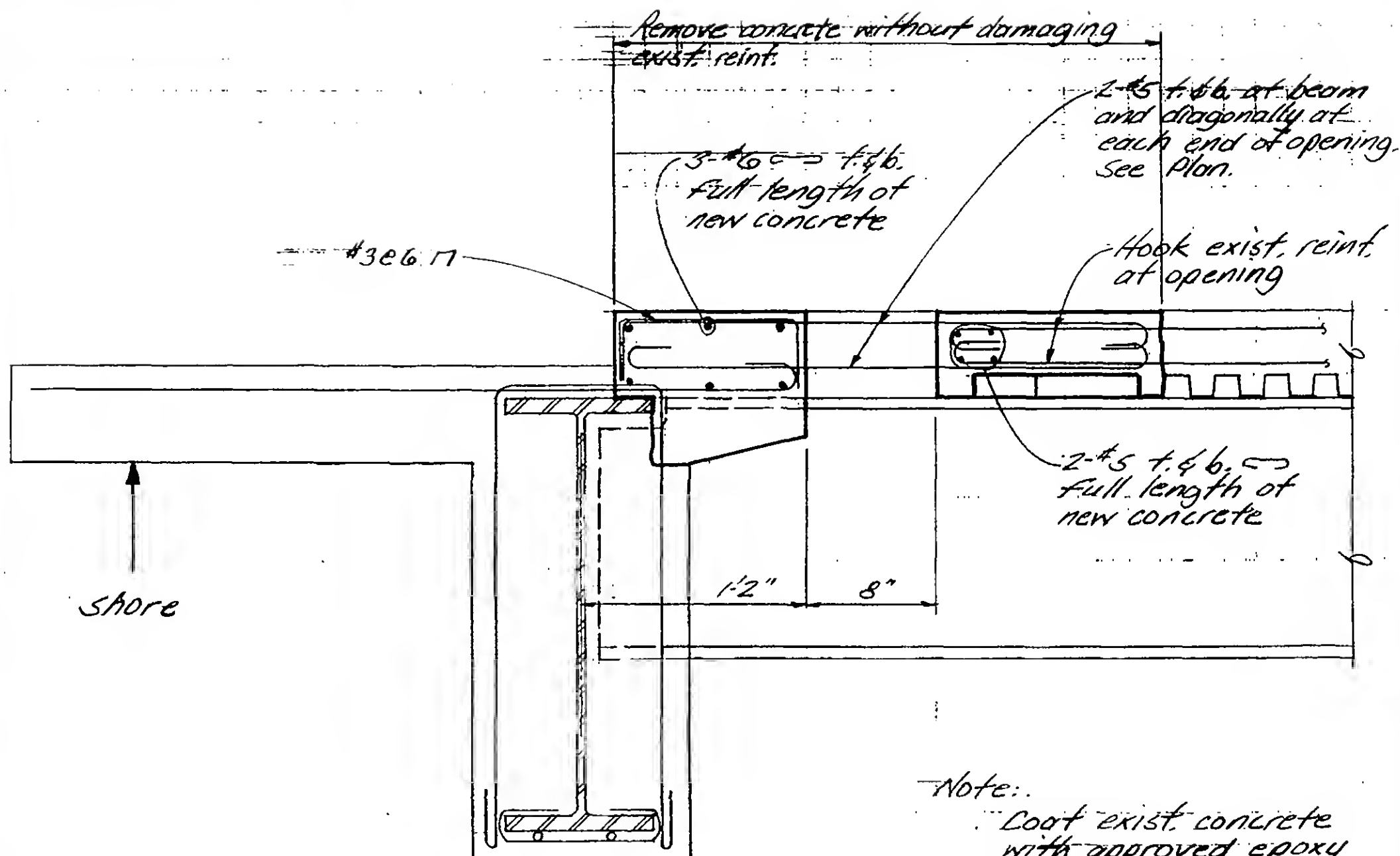
TITLE

ALAZA - SECTION AT BUILDING EDGE

DATE

1-21-72

REVISIONS



Note:

Coat exist. concrete
with approved epoxy
bonding compound
before casting new
concrete.

Section A-A



DESIGNED

DRAWN

REVIEWED

19 E-2012.1

PROJECT

THE WORLD TRADE CENTER

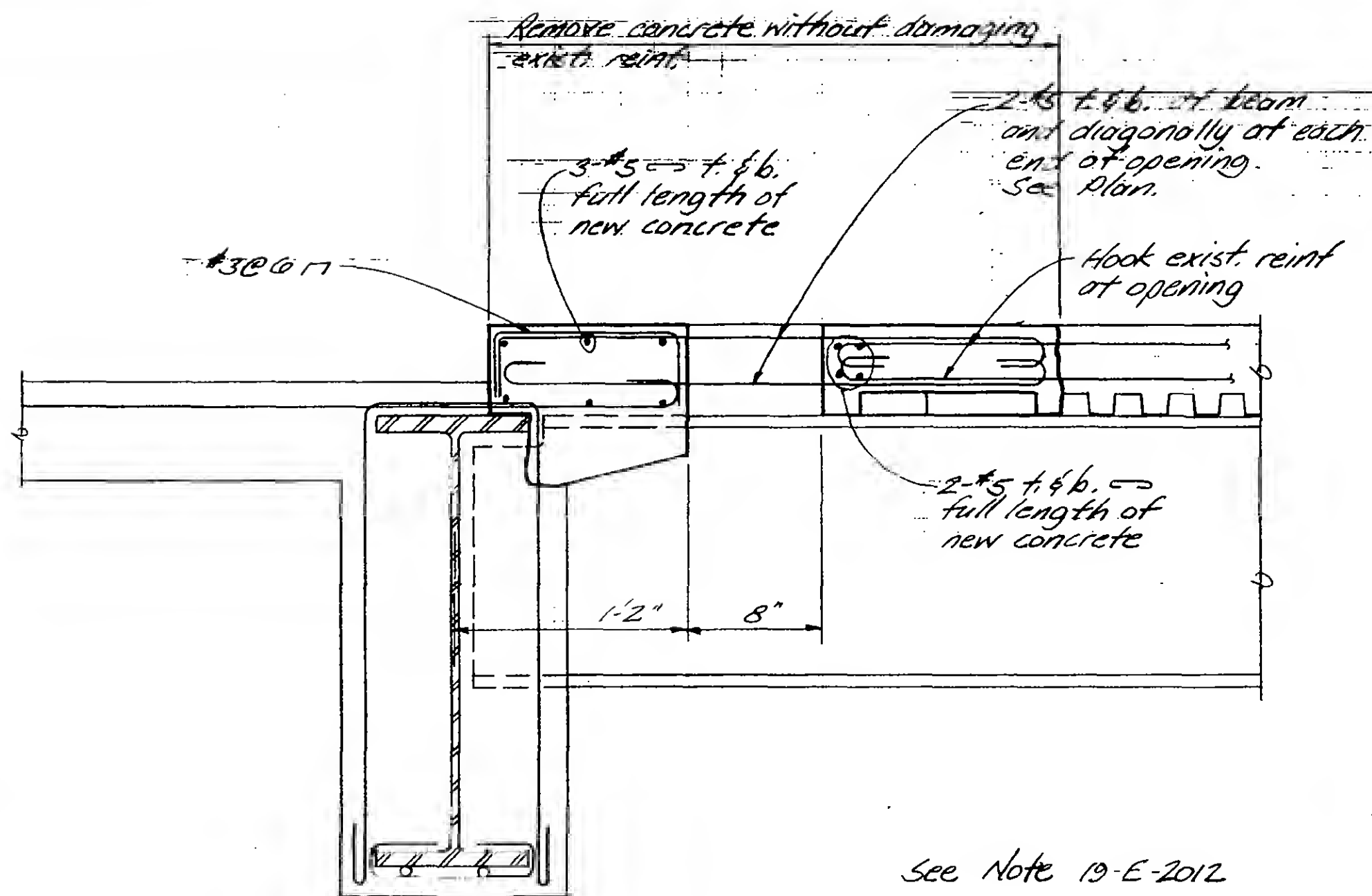
TITLE

PLAZA - SECTION AT BUILDING EDGE

DATE

1-21-72

REVISIONS

Section B-B

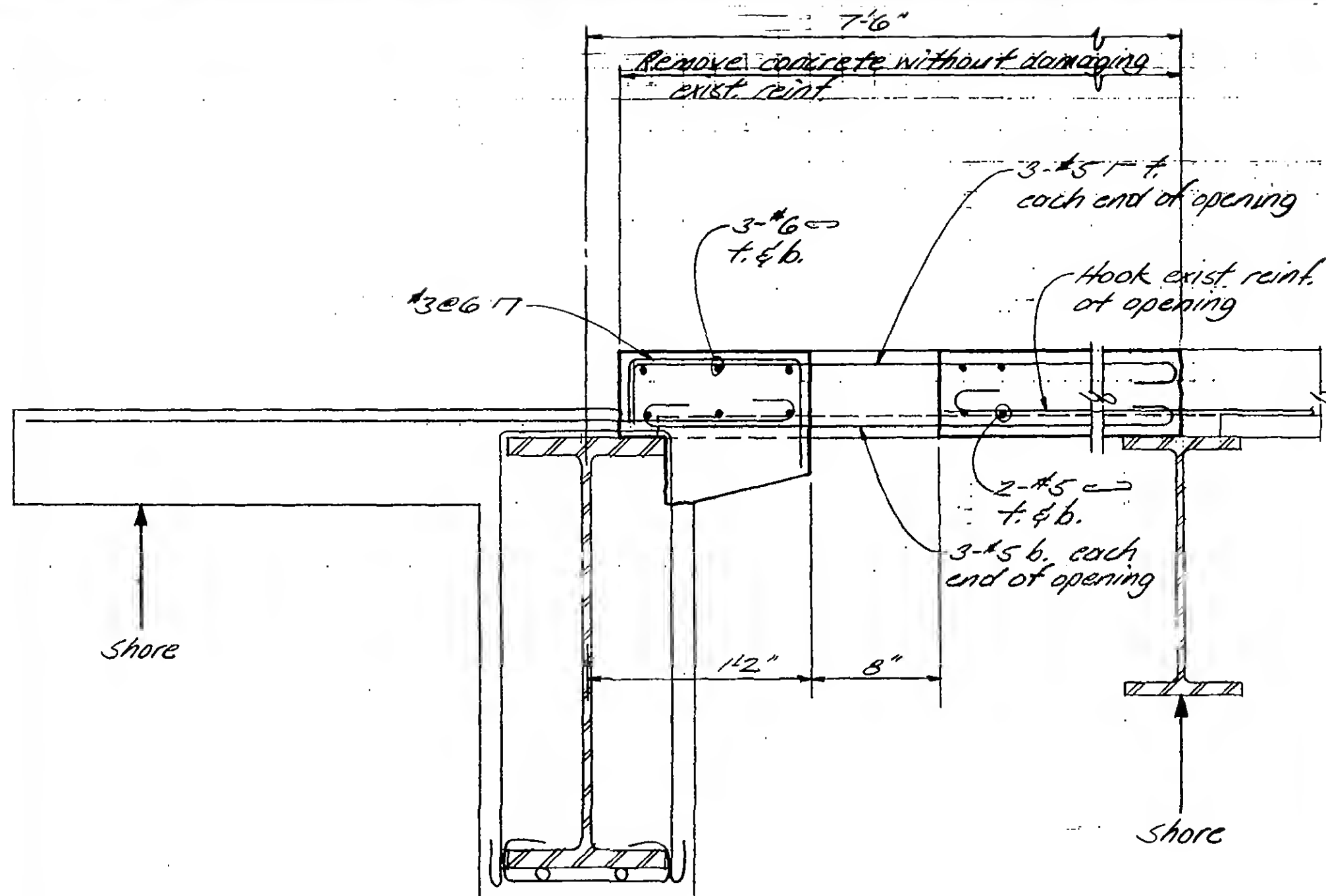
DESIGNED

DRAWN

REVIEWED

19 E-2012.2

REVISIONS



- See Note 19E-2012.1

Section C-C

19E-2012.3



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DRAWN

REVIEWED

PROJECT

THE WORLD TRADE CENTER

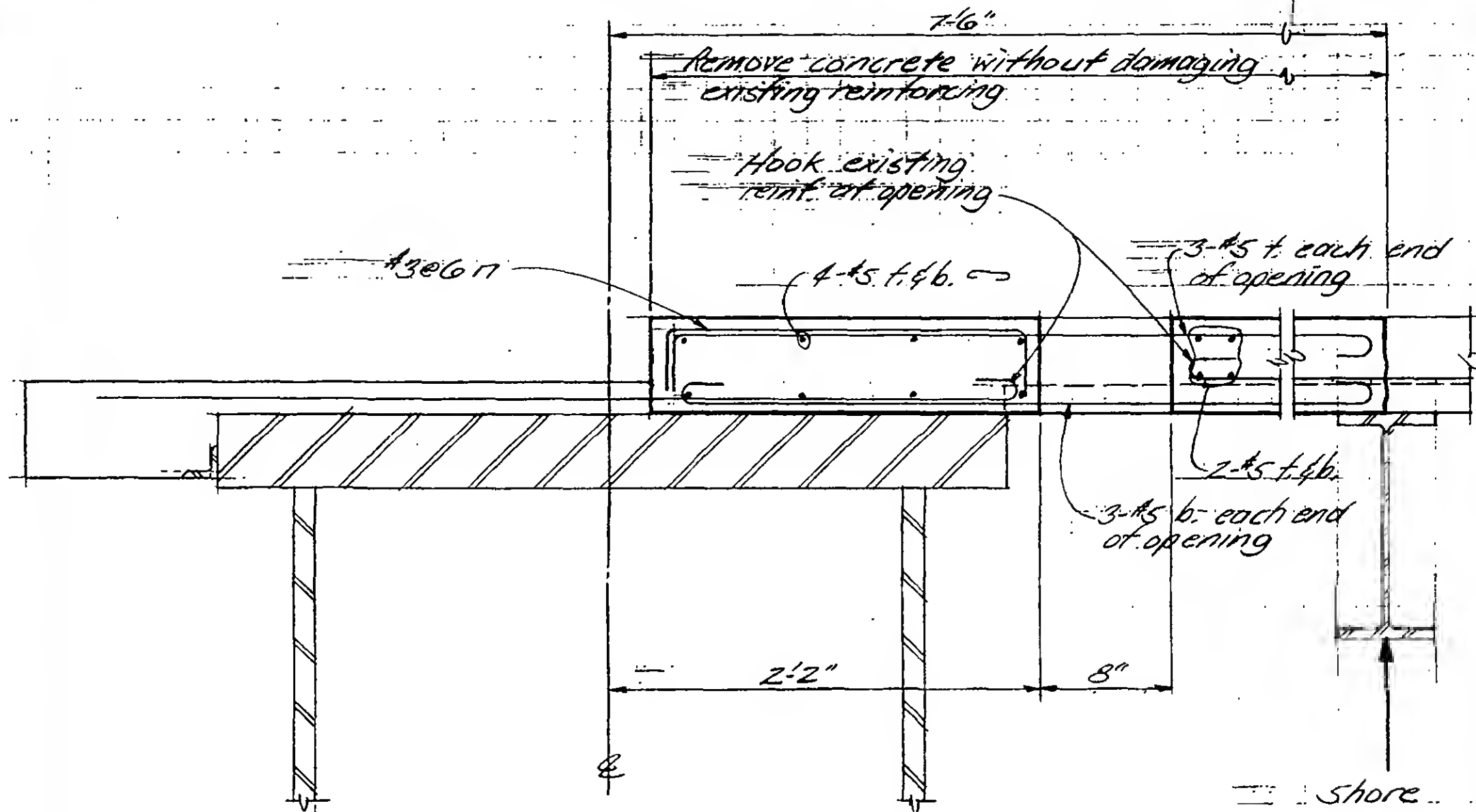
TITLE

PLAZA SECTION AT BUILDING EDGE

DATE

1-21-72

REVISIONS

Section D-D

See Note 19-E-2012.1

19-E-2012.4



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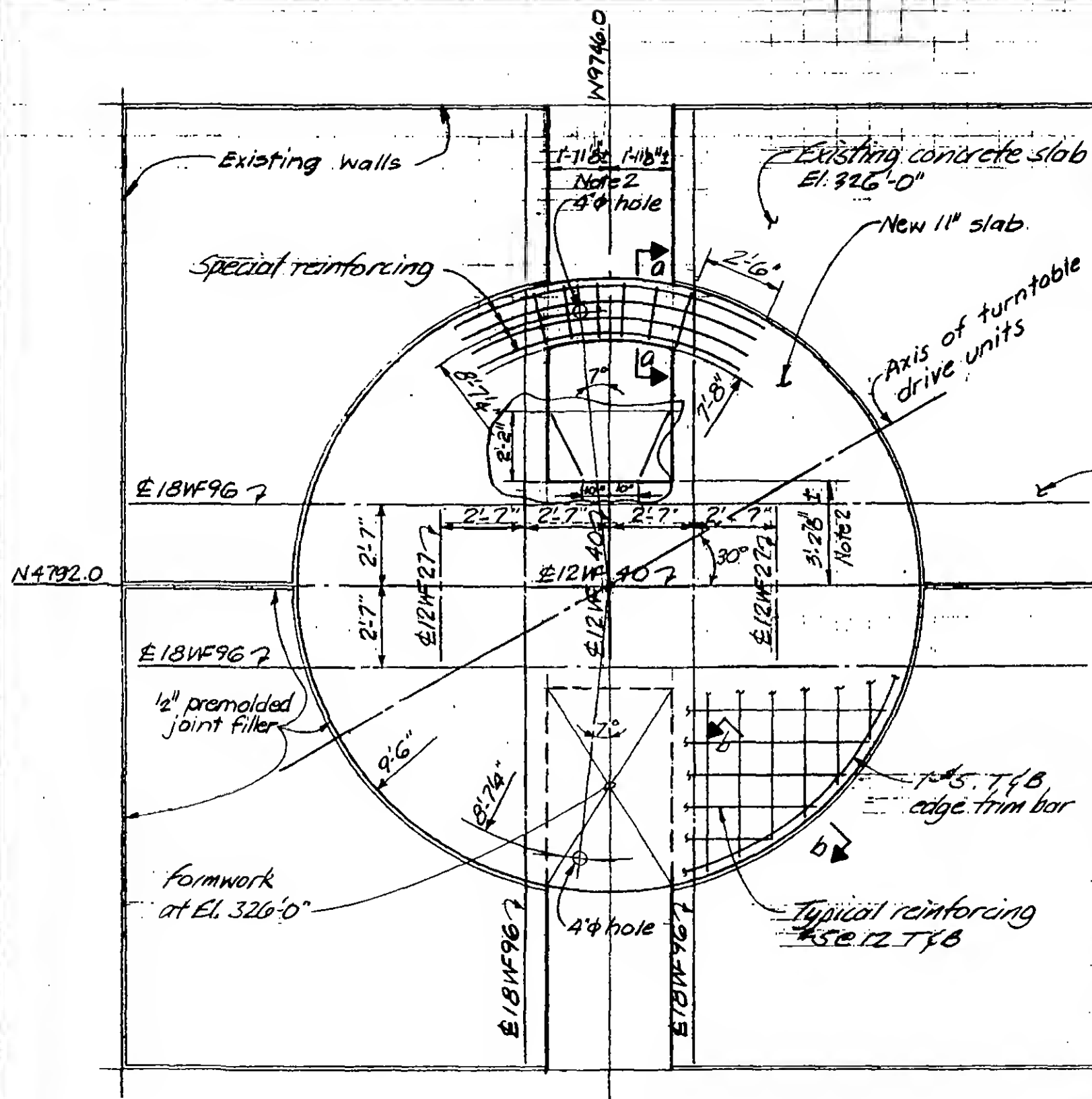
DRAWN

REVIEWED

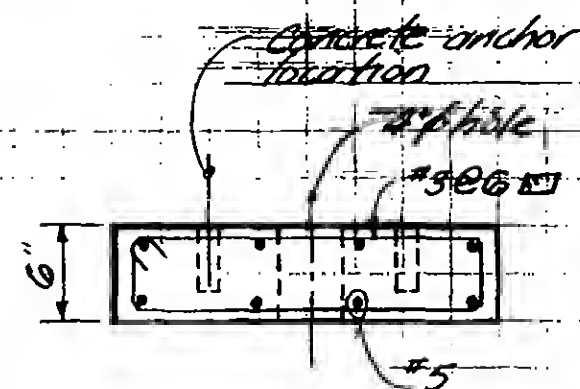
REVISIONS

2/9/72

2/29/72



Plan



Section a-a



Note 1. Contractor for contract WTC-117.00 to install all anchor bolts and other embedded items furnished by others and to furnish and install all other embedded items.

Note: 2 Align with existing concrete outline.



DESIGNED
R. FOWLER

DRAWN
A. FRANQUI

REVIEWED

19-E-2013.1

PROJECT

THE WORLD TRADE CENTER

TITLE

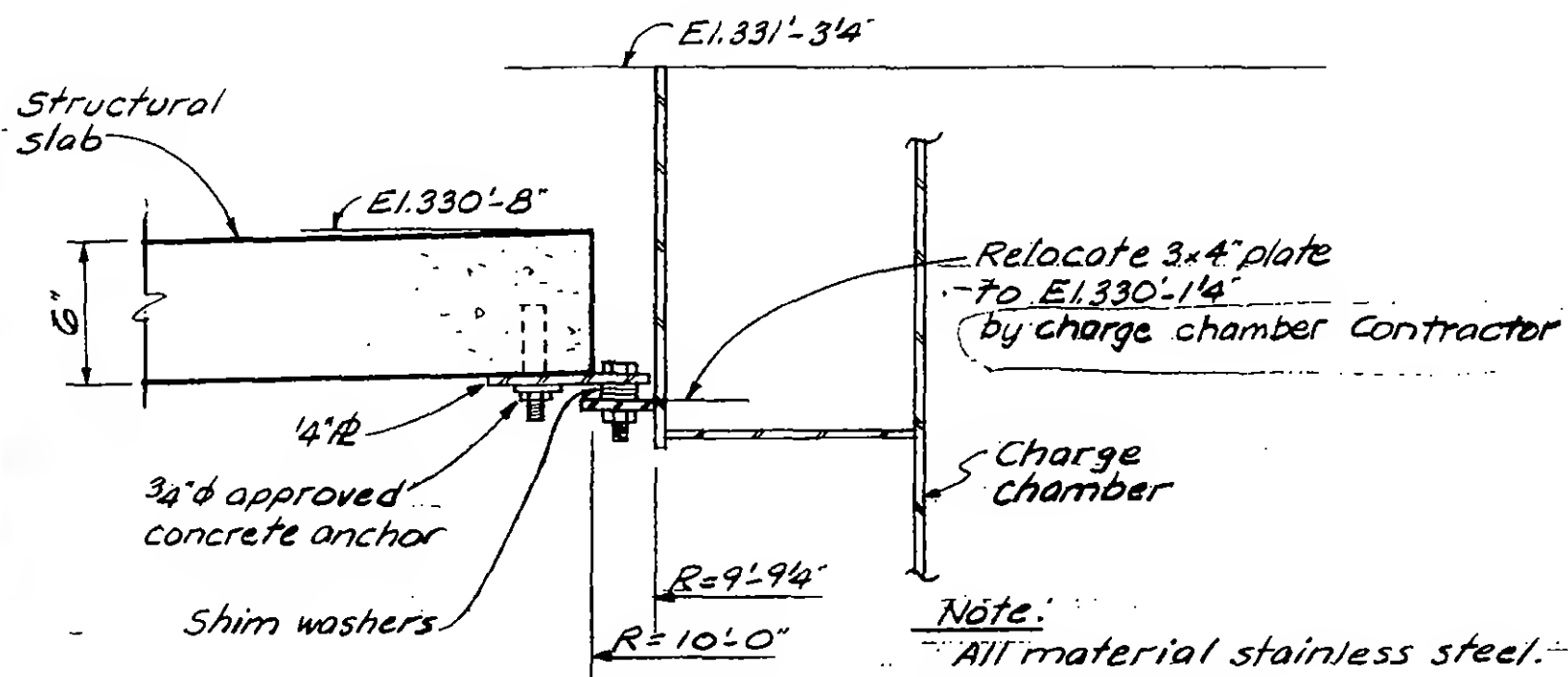
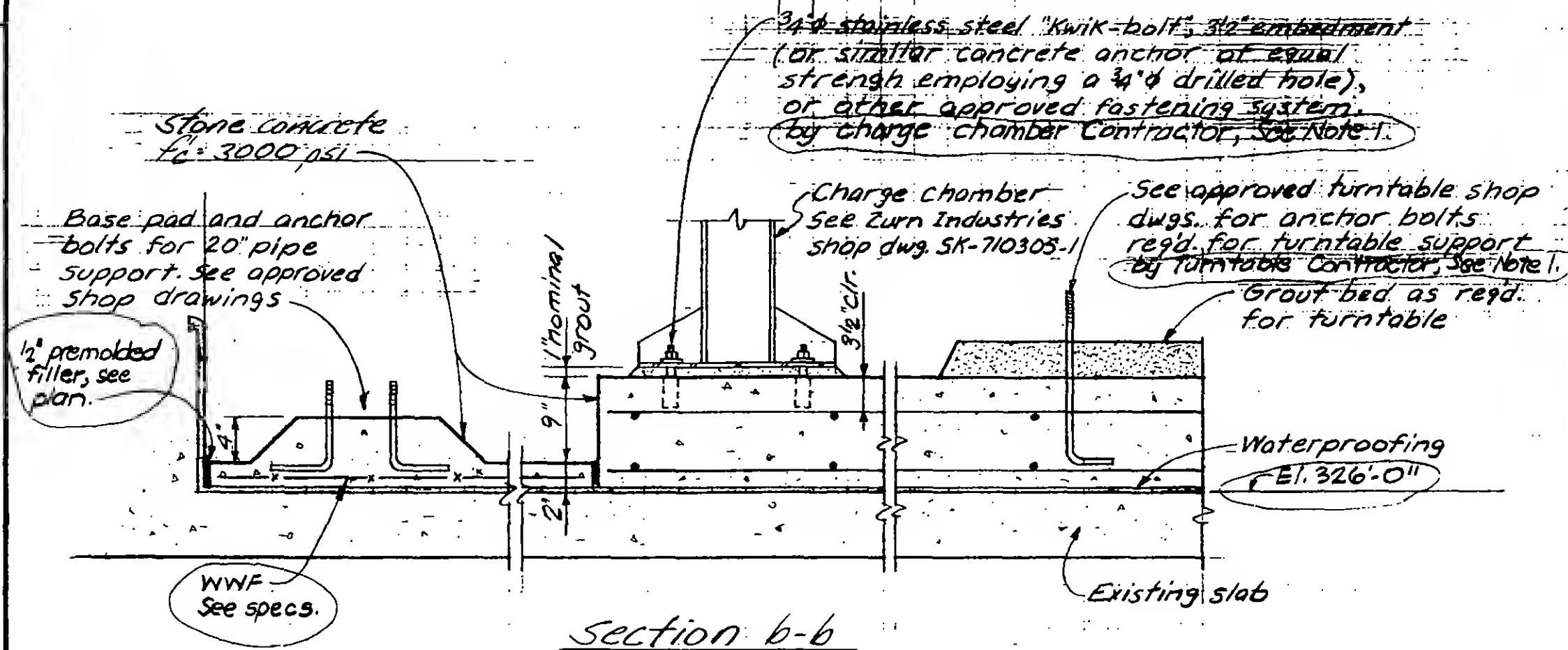
BASE PAD FOR TURNABLE AND CHARGE CHAMBER

DATE

2-2-72

REVISIONS

2/9/72



Detail at Top of Charge Chamber

DESIGNED
R. FOWLERDRAWN
A. FRANQUI

REVIEWED

PROJECT

THE WORLD TRADE CENTER

TITLE

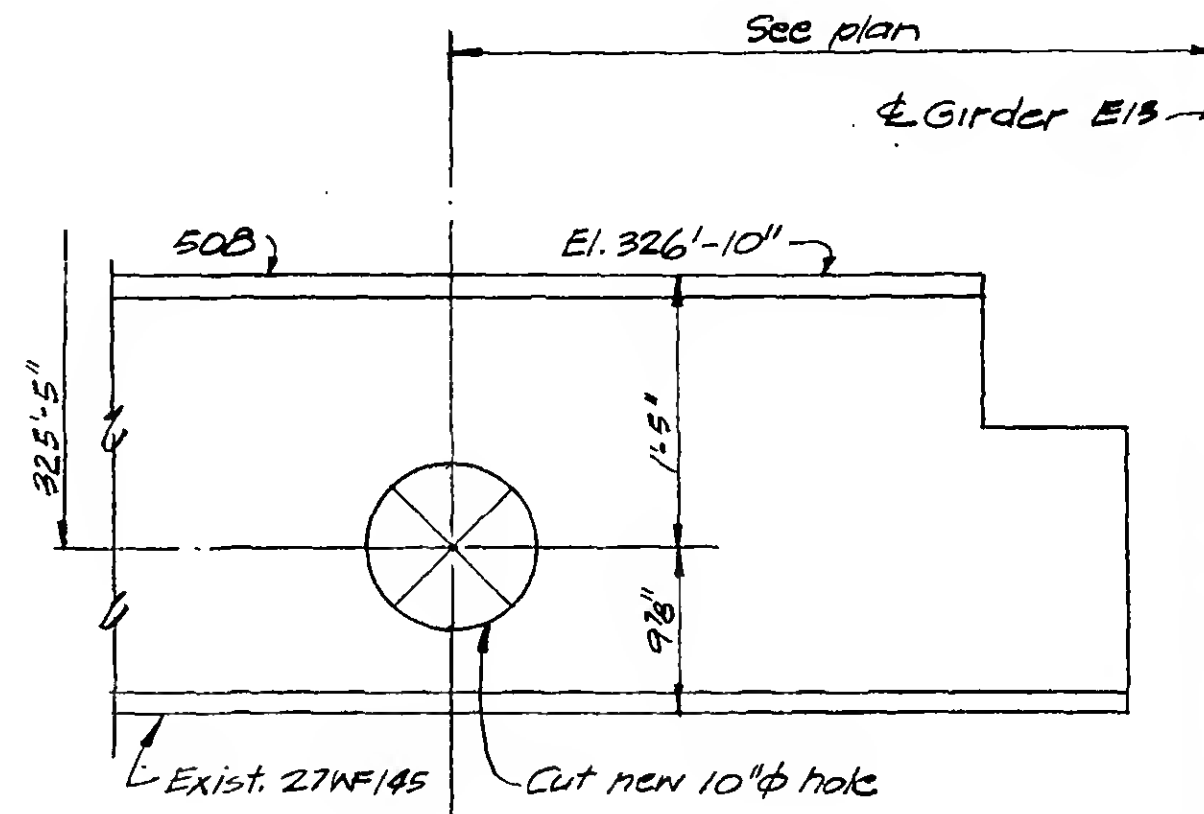
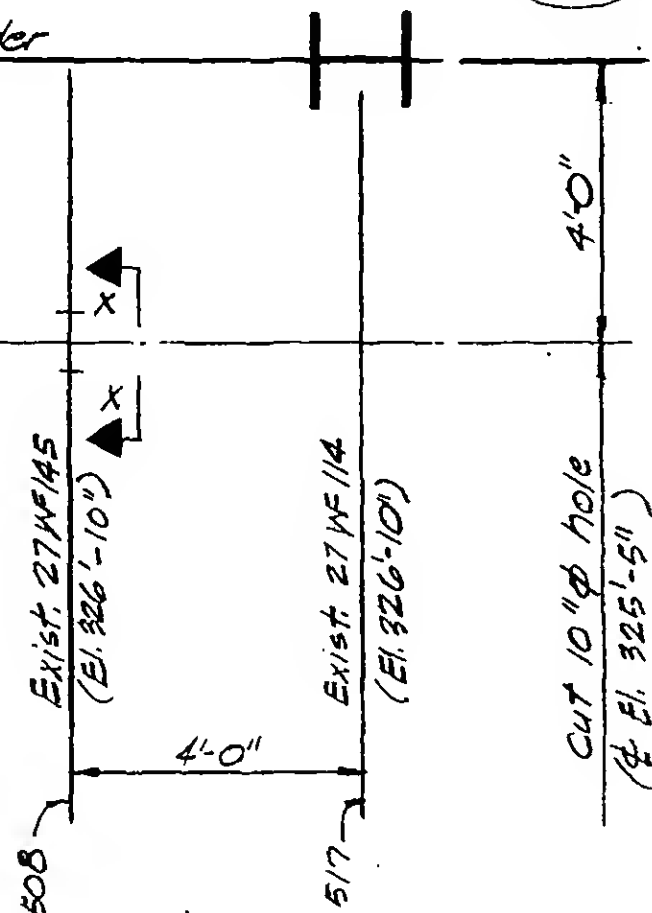
NEW OPENING - EL 332 - NORTHEAST BUILDING

DATE

2-18-72

REVISIONS

NORTH

E20
7Exist girder
E13

PART PLAN
EL. 332' (SW) SNE-8

SECTION X-X



DESIGNED

DRAWN

PMOceli

REVIEWED

19-E-2014

PROJECT

THE WORLD TRADE CENTER

TITLE

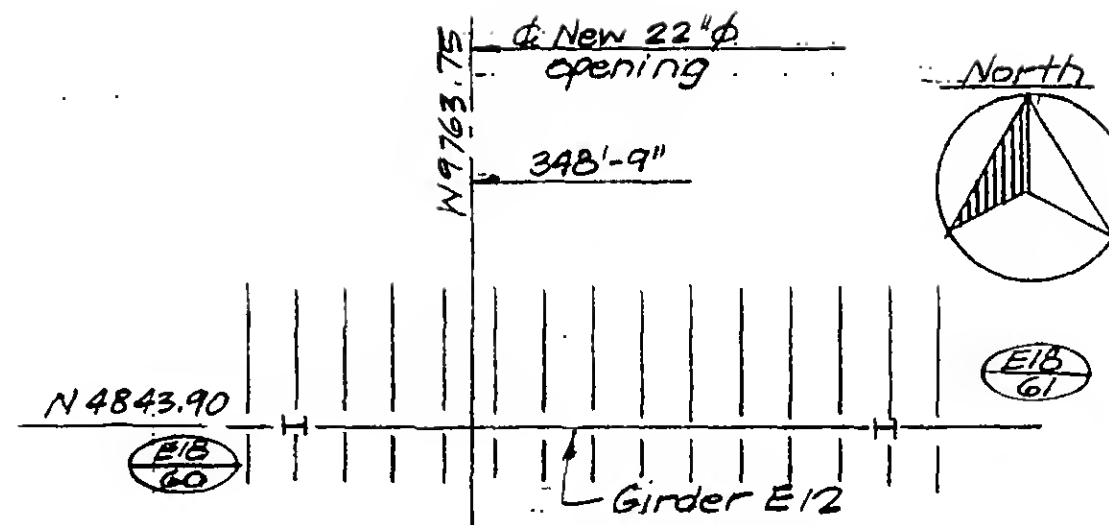
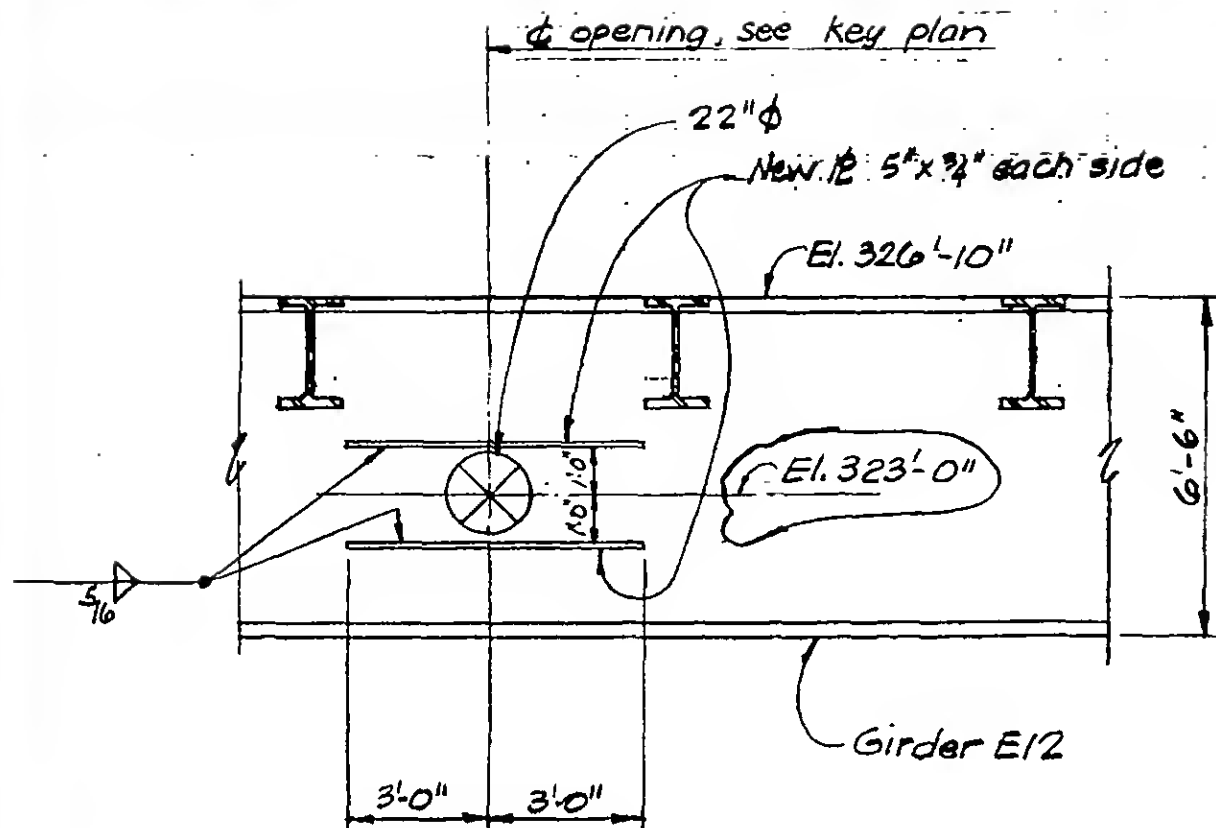
BEAM OPENING AT EL. 332

DATE

3-24-72

REVISIONS

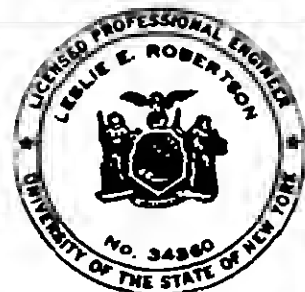
4/10/72



Notes:

1. All new material to be ASTM A36.
2. All welds to be made with E70xx low hydrogen electrodes.
3. Complete installation of new plates prior to cutting existing material.
4. Smoothness of gas cut edges shall be ASA 500 or smoother.

KEY PLAN @ EL. 332
N.E. Bldg. Ref. dwg SNE-8



DESIGNED

WAB

DRAWN

P.M. O'Brien

REVIEWED

W. P. Bower

19-E-2015

PROJECT

THE WORLD TRADE CENTER

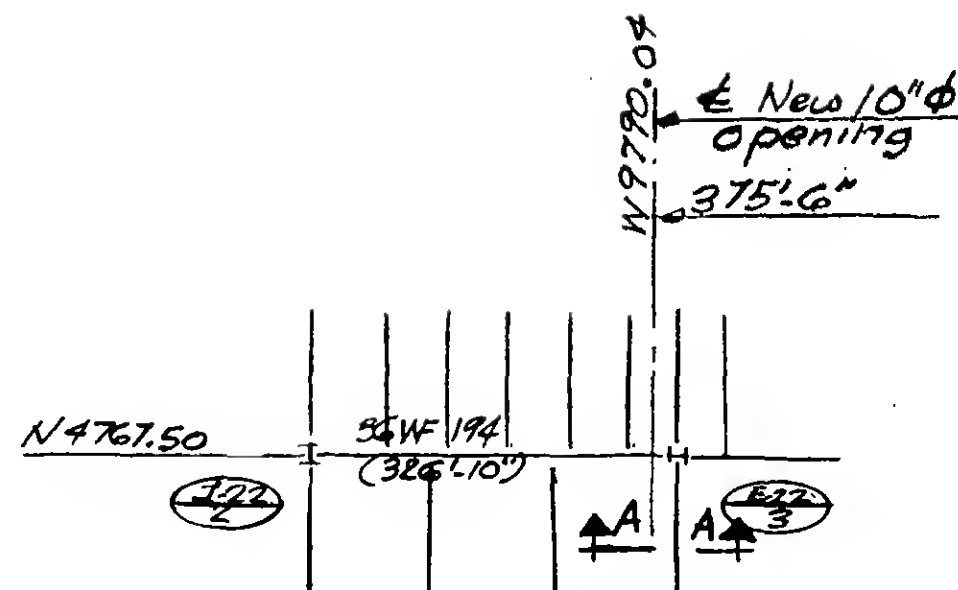
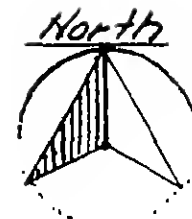
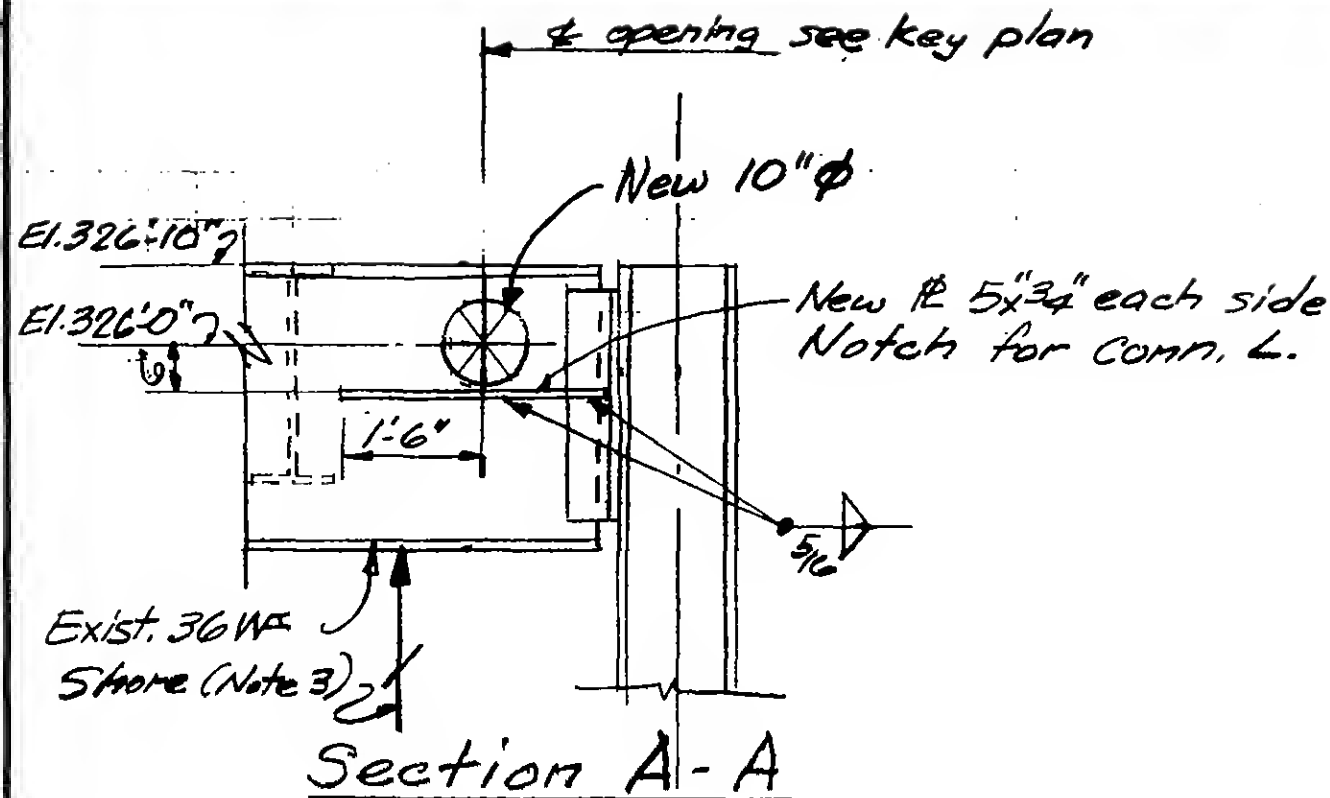
TITLE

BEAM OPENING AT EL. 332

DATE

3-24-72

REVISIONS



KEY PLAN @ EL 332
NE Bldg. Ref. dwg SNE-8

Notes:

1. All new material to be ASTM A36.
2. All welds to be made with E70xx low hydrogen electrodes.
3. Complete installation of new plates and bolts prior to cutting existing material. Shore beam during cutting operation.
4. Smoothness of gas cut edges shall be ASA 500 or smoother.



DESIGNED

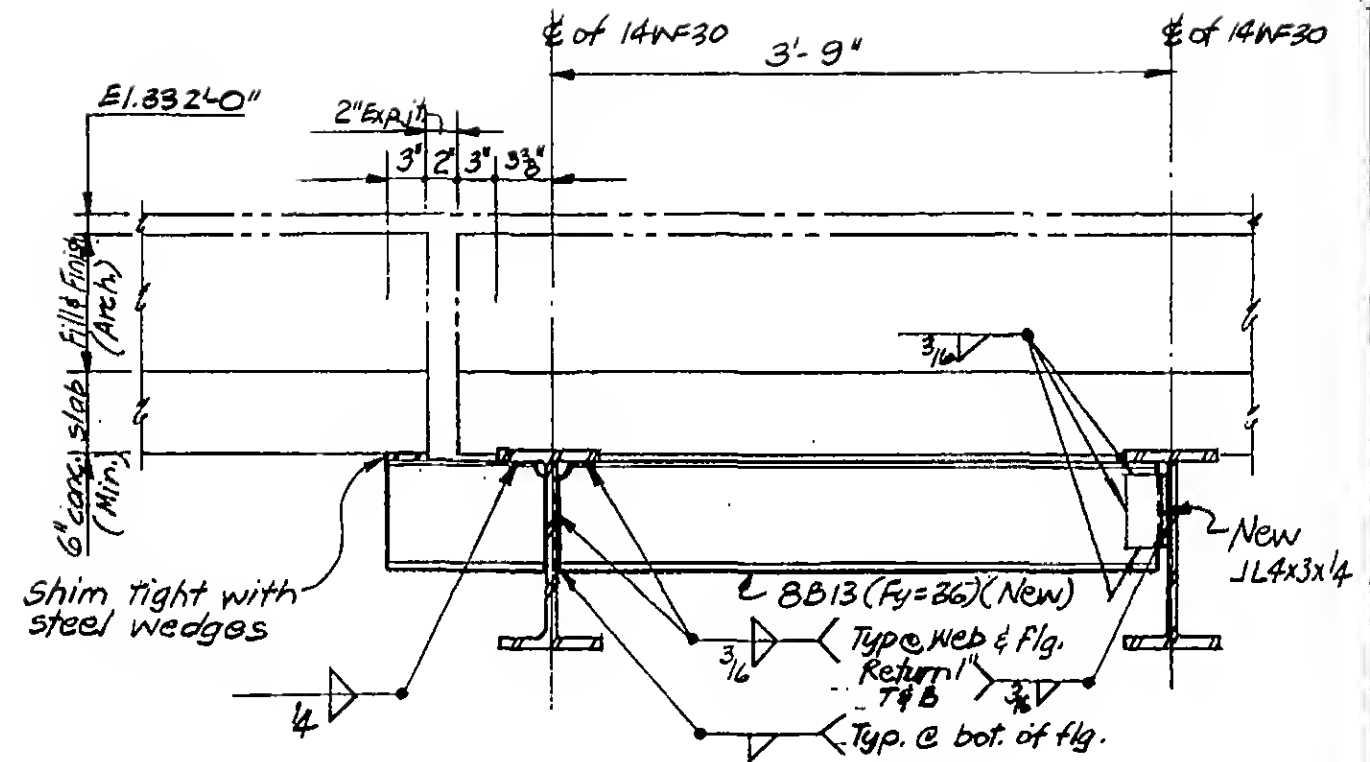
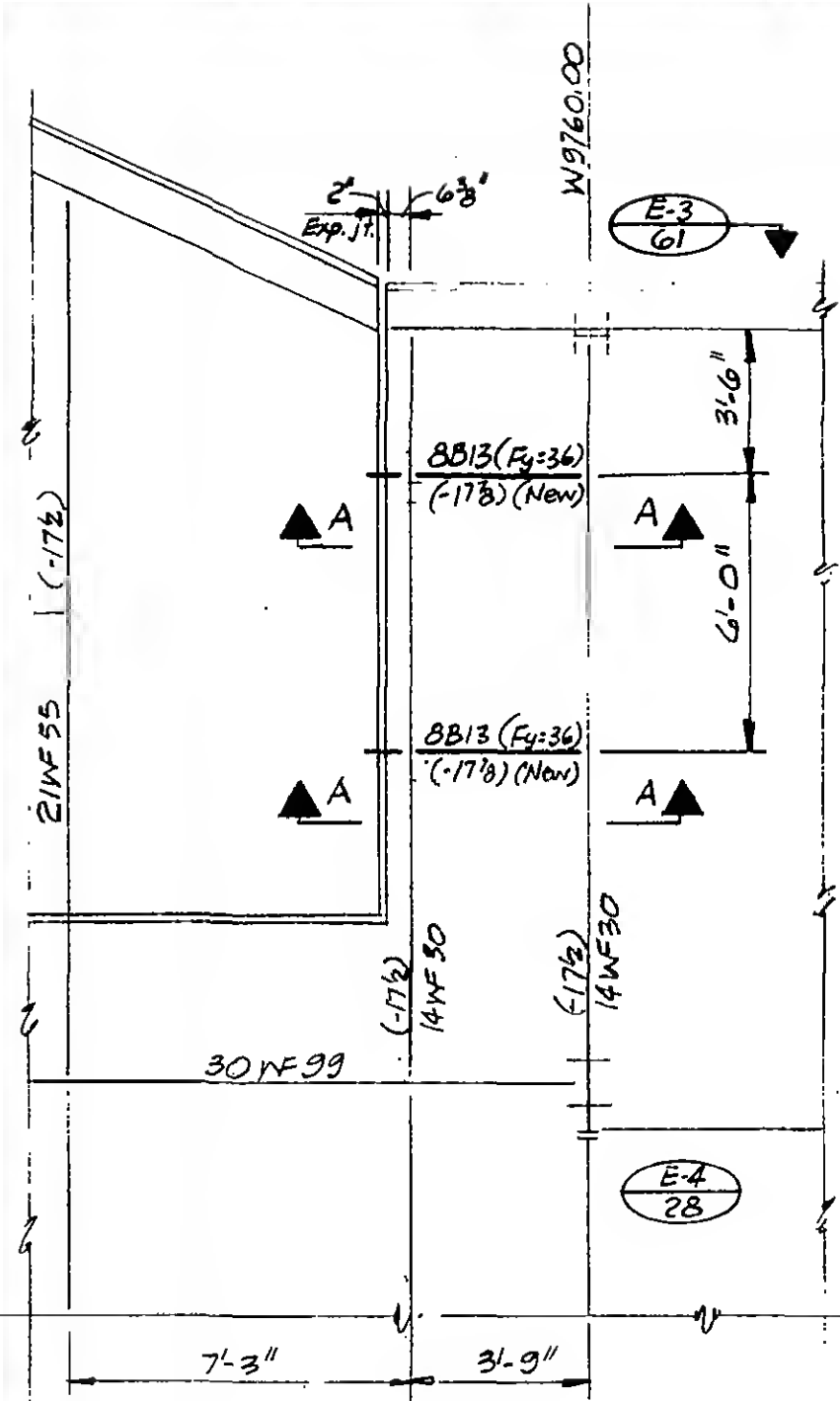
DRAWN

REVIEWED

D. Brewer

19-E-2016

REVISIONS



Section A-A

Partial Floor Framing @ NW Corner



DESIGNED

KH

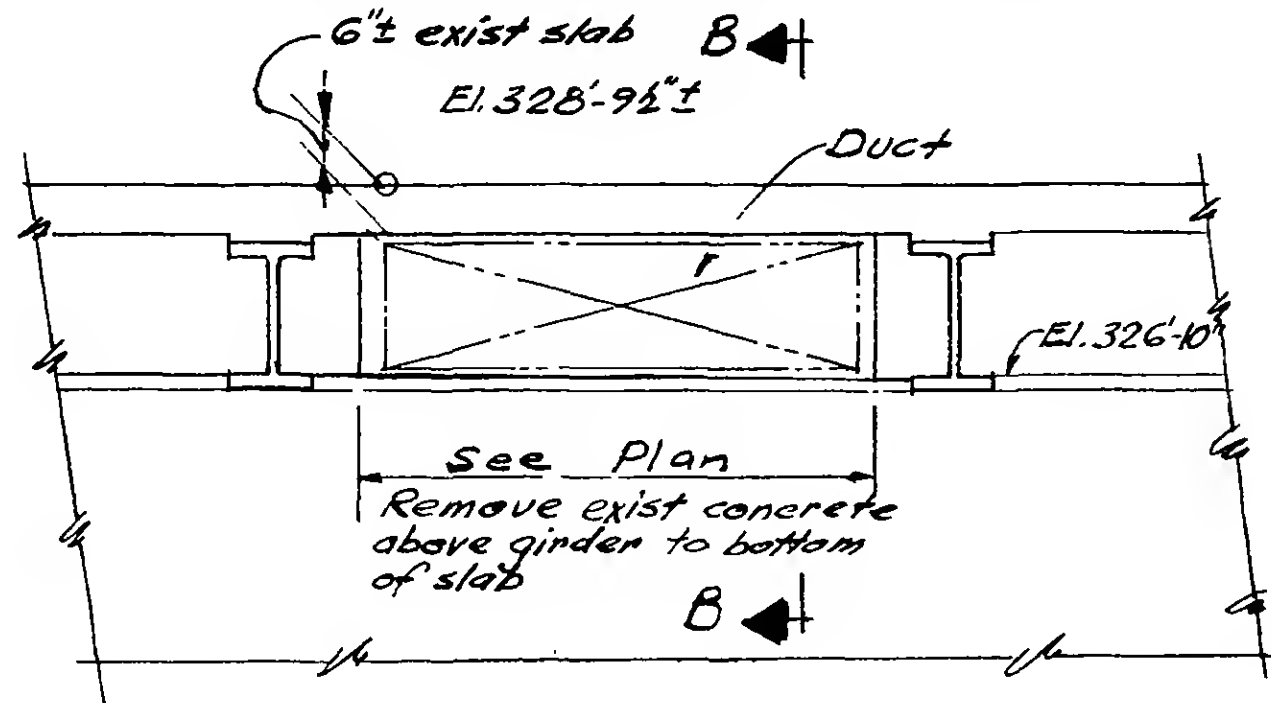
DRAWN

REVIEWED

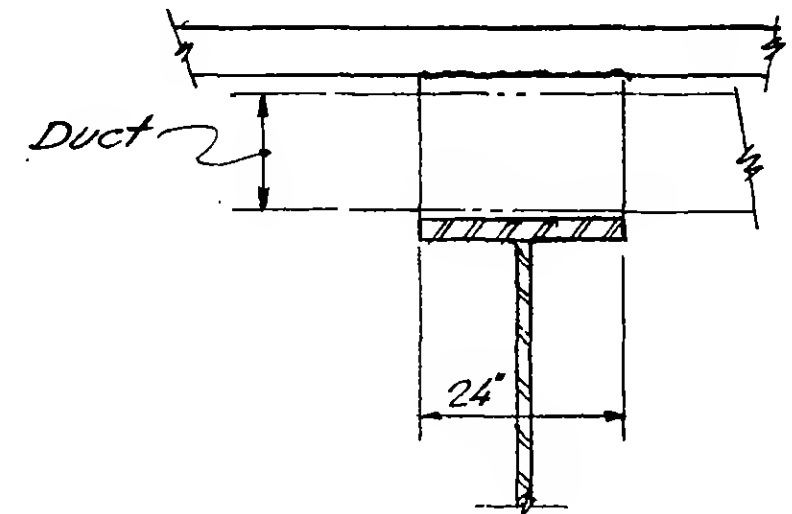
WAB

19-E-2017

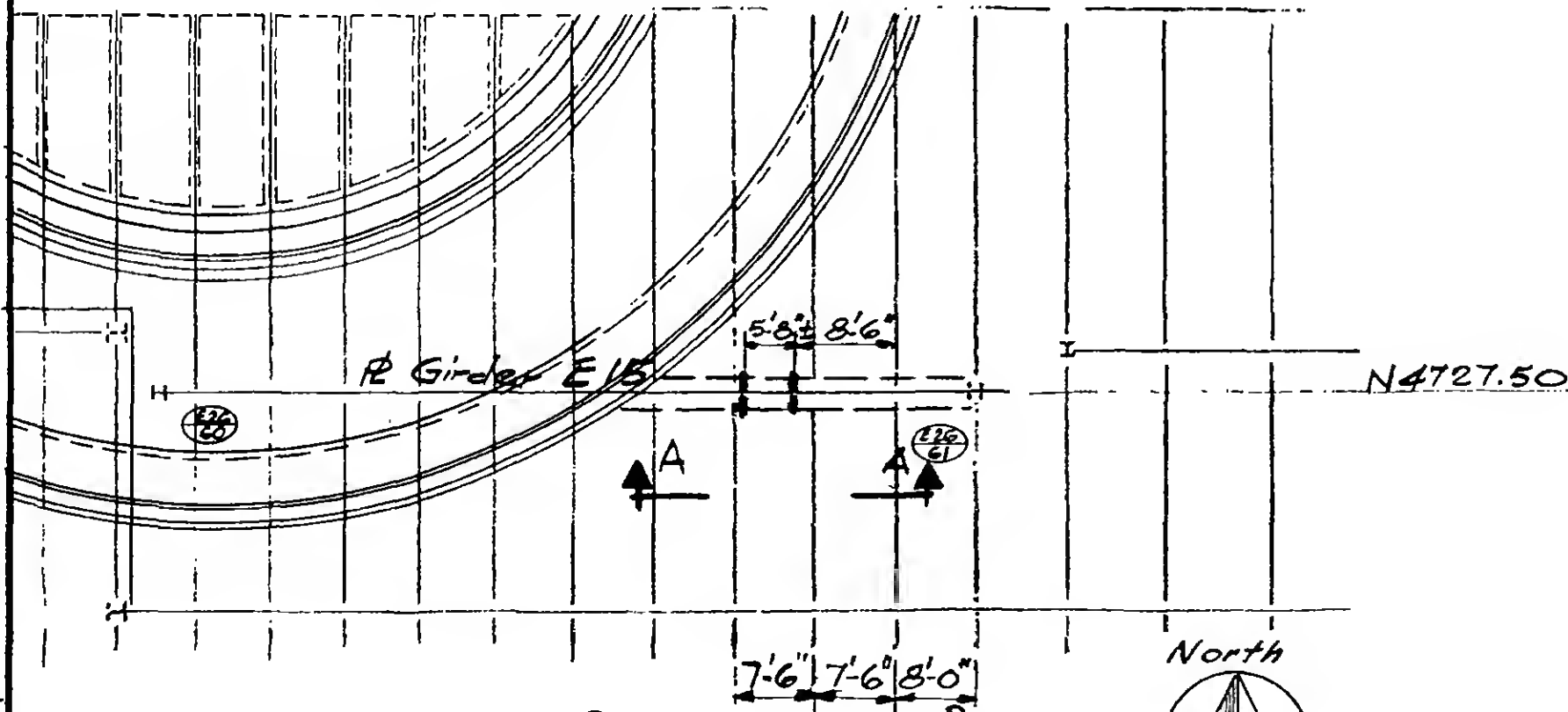
REVISIONS



Section A-A



Section B-B



Key Plan

For information not shown See SNE-29#39



DESIGNED

DRAWN

REVIEWED

JG

WOB

19-E-2018

SKILLING, HELLE, CHRISTIANSEN, ROBERTSON

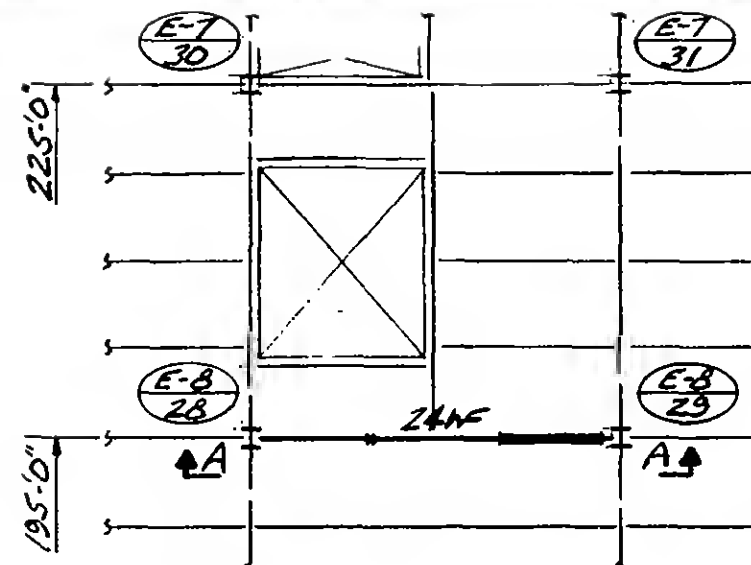
Structural & Civil Engineers

PROJECT THE WORLD TRADE CENTER

TITLE BEAM CUTS - FLOOR 4 NE BLDG.

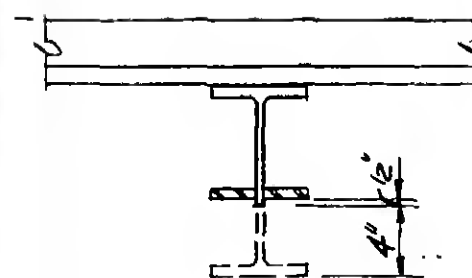
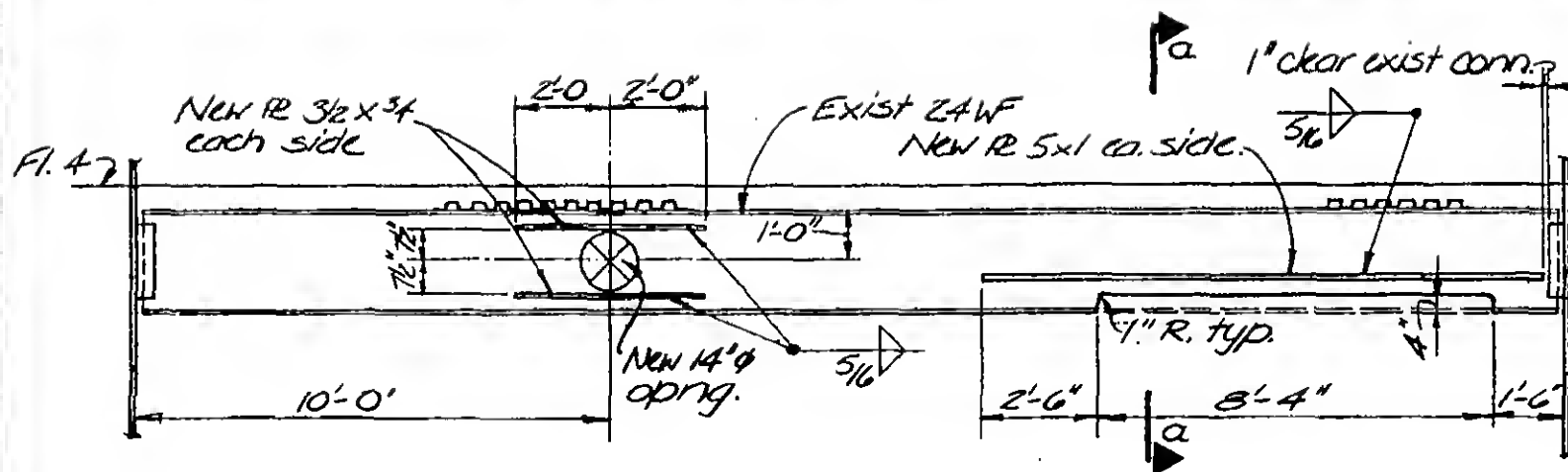
DATE 7-6-73

REVISIONS



PART PLAN Fl. 4 East

SNE-13



Install new R's
before removing
exist. material



DESIGNED JTM

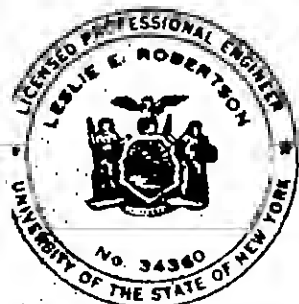
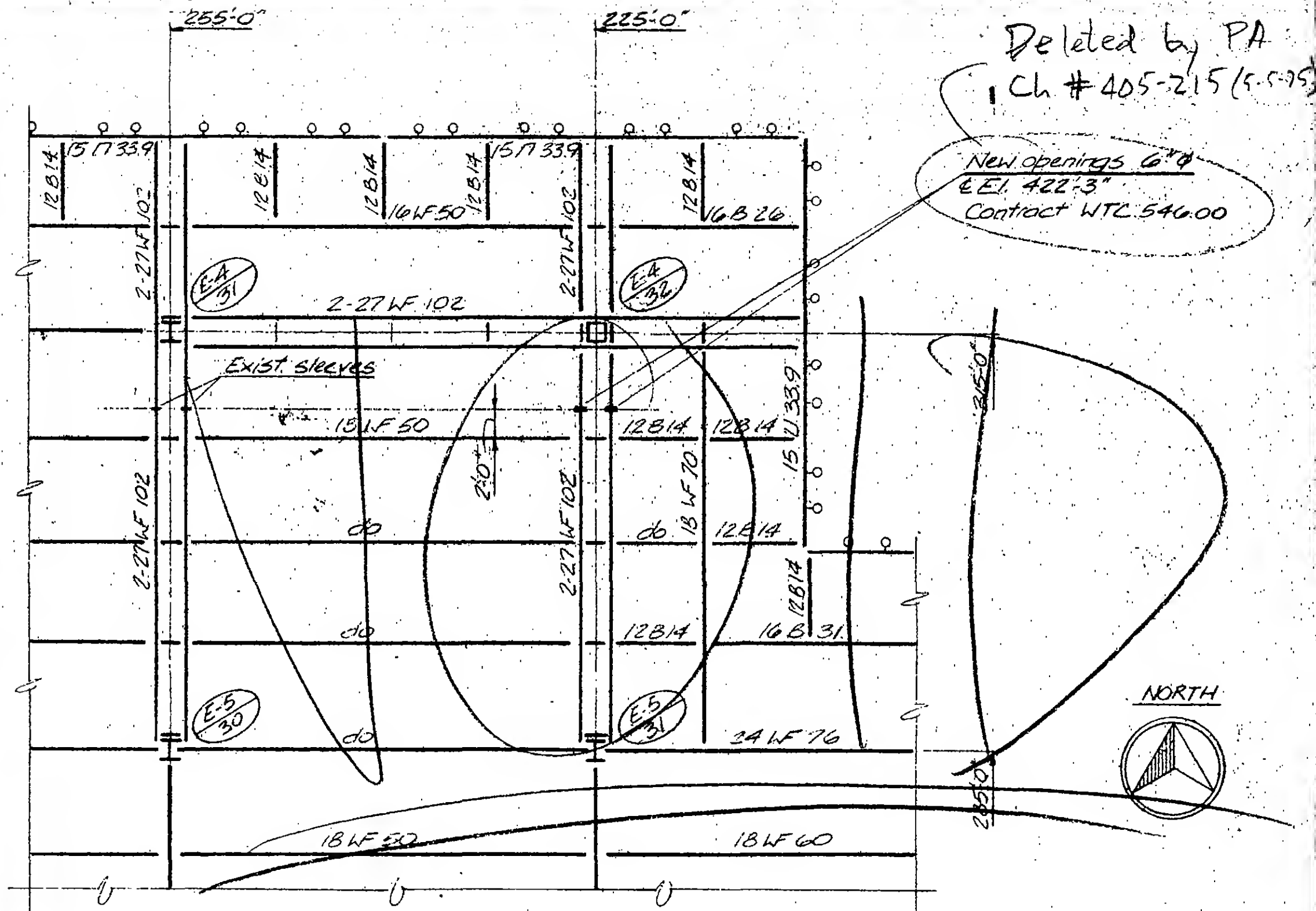
DRAWN JA

REVIEWED wab

A a

19-E-2019

REVISIONS



SIGNED

WAB

DRAWN

JB

REVIEWED

WAB

19-E-2020

PROJECT

THE WORLD TRADE CENTER

TITLE

MODIFICATION TO RM ROOF FRAMING - TOWER B

DATE

9-27-71

REVISIONS

CONSTRUCTION PROCEDURE

1. Temporarily remove two 12W40 and two 12W45 bearing on girder 4-2P at coordinates 106'-11", 113'-7", 120'-3" and 126'-11".
2. Remove and discard three 12W40 with 12W40 stubs and one 12W58 at lower framing. (19B-2100A1).
3. Shore all framing connected to girder and columns 608 and 708.
4. Disconnect all members framing to girder. Cut 24WF and 24B. Raise girder sufficiently to permit installation of new stubs on columns 608 and 708. (19B-2100B1 & B2).
5. Install girder in new location, fixing and reconnecting members framing thereto. (19B-2100A1, A2, B1 & B2).
6. Remove shores.



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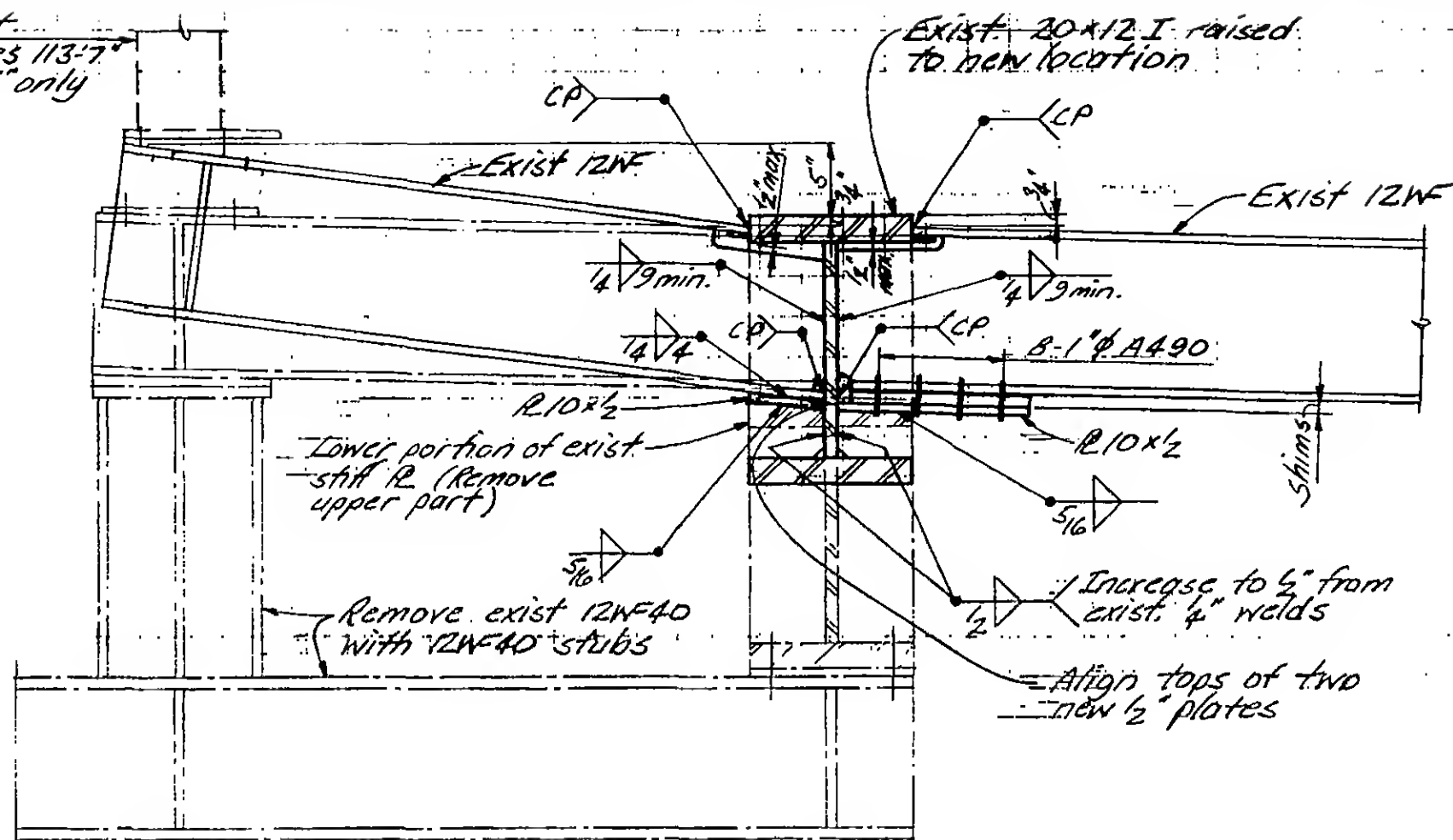
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Future at
coordinates 113'-7"
and 126'-11" only



Detail A1

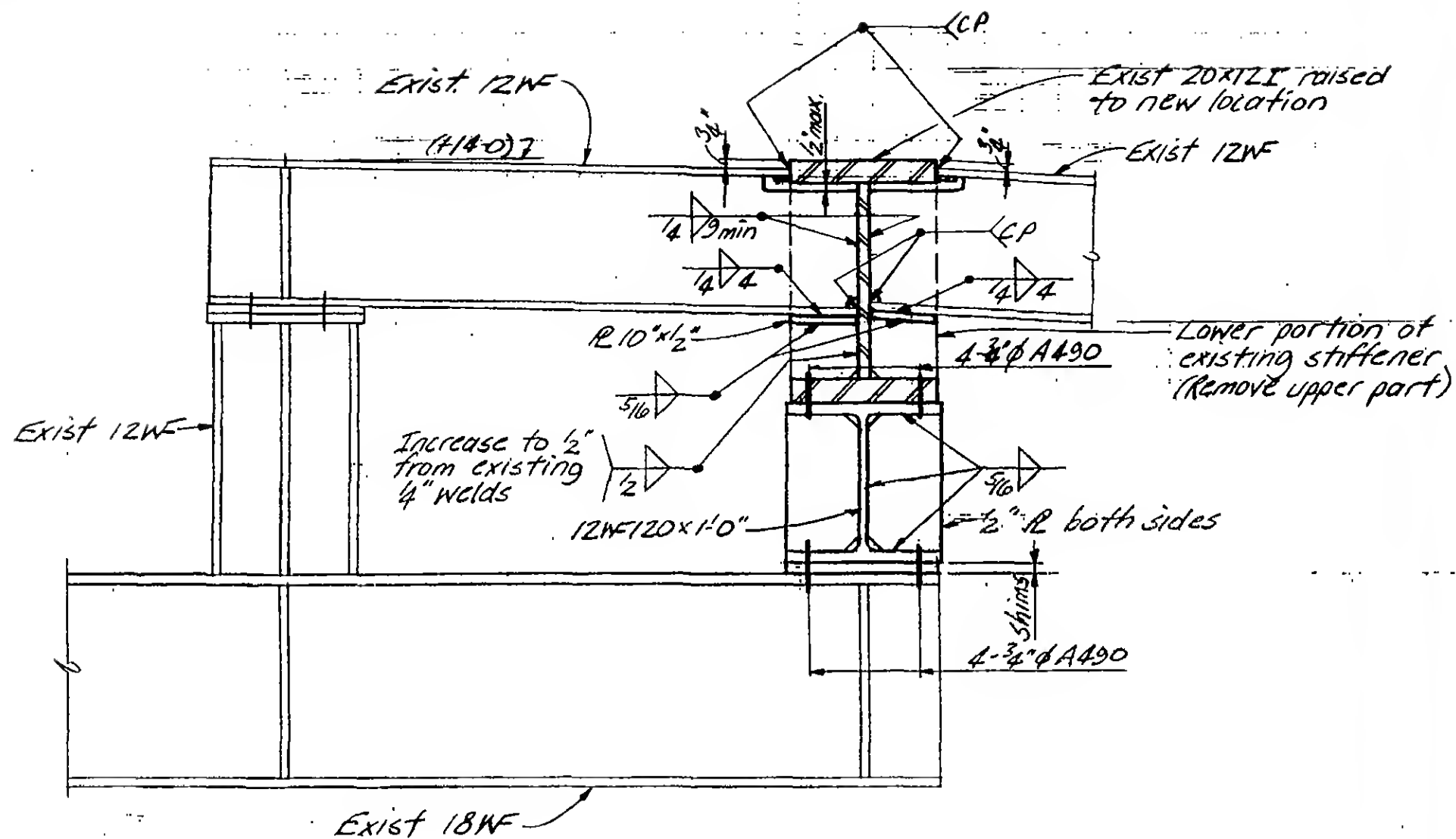


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Detail A2



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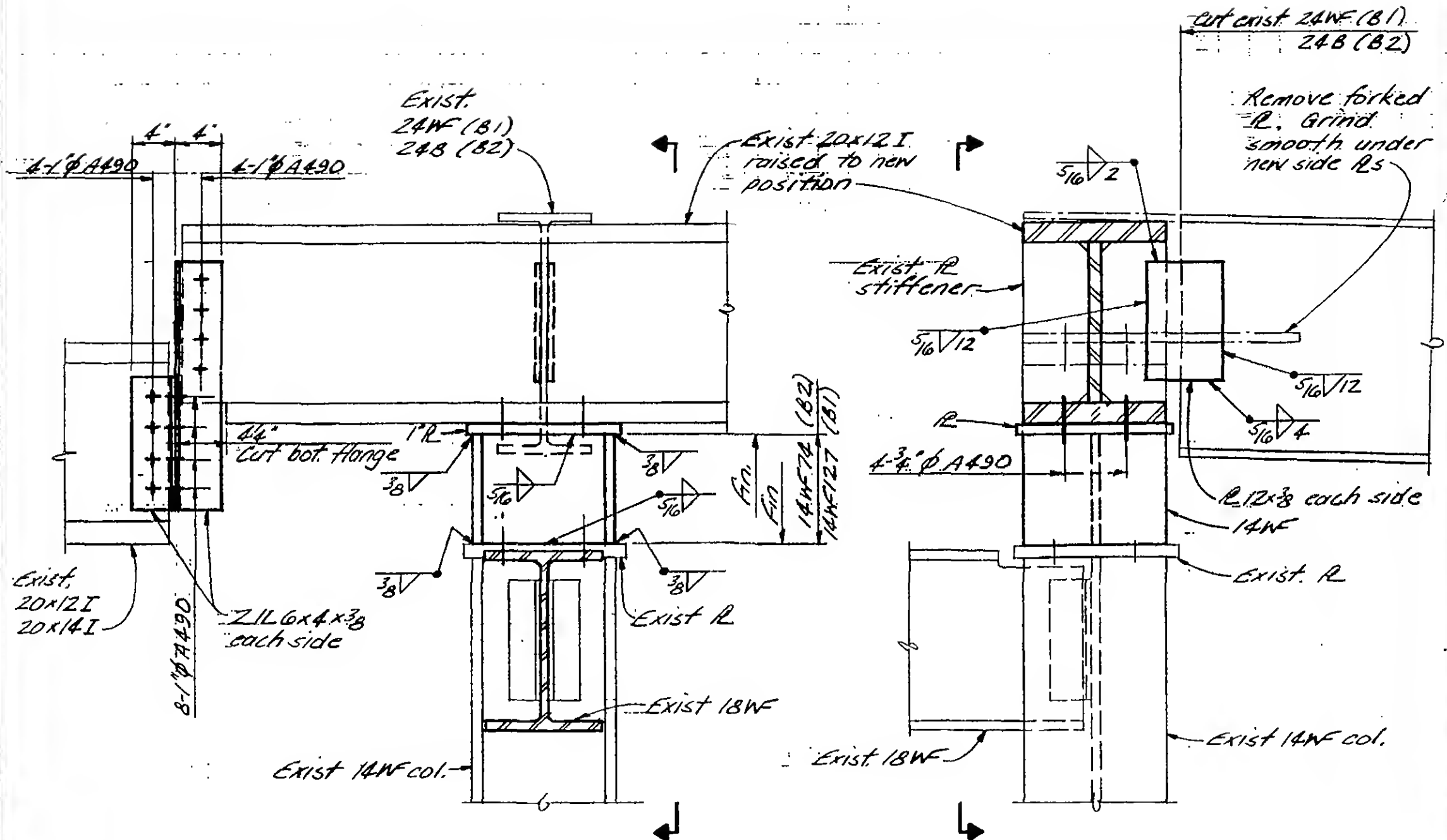
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Detail B1 & B2



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PROJECT

THE WORLD TRADE CENTER

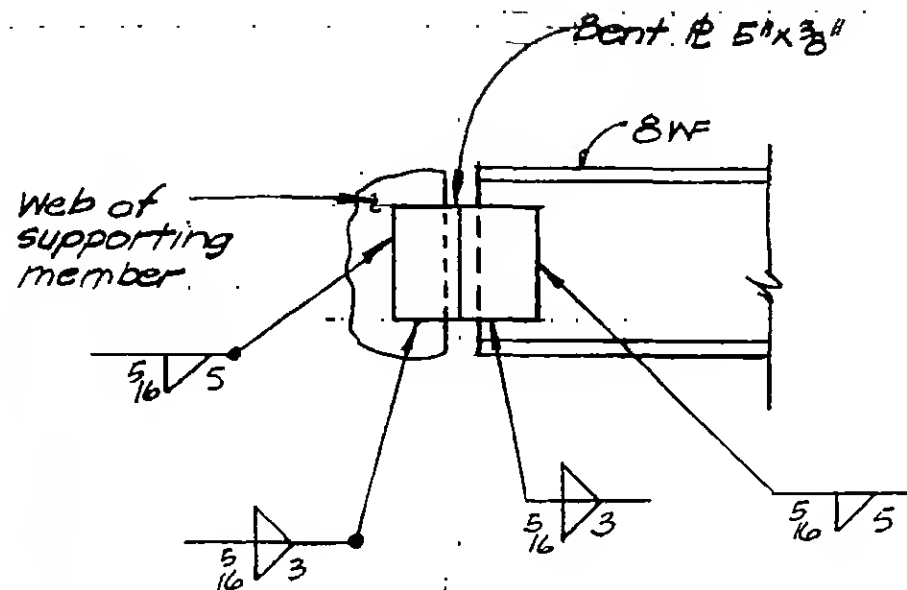
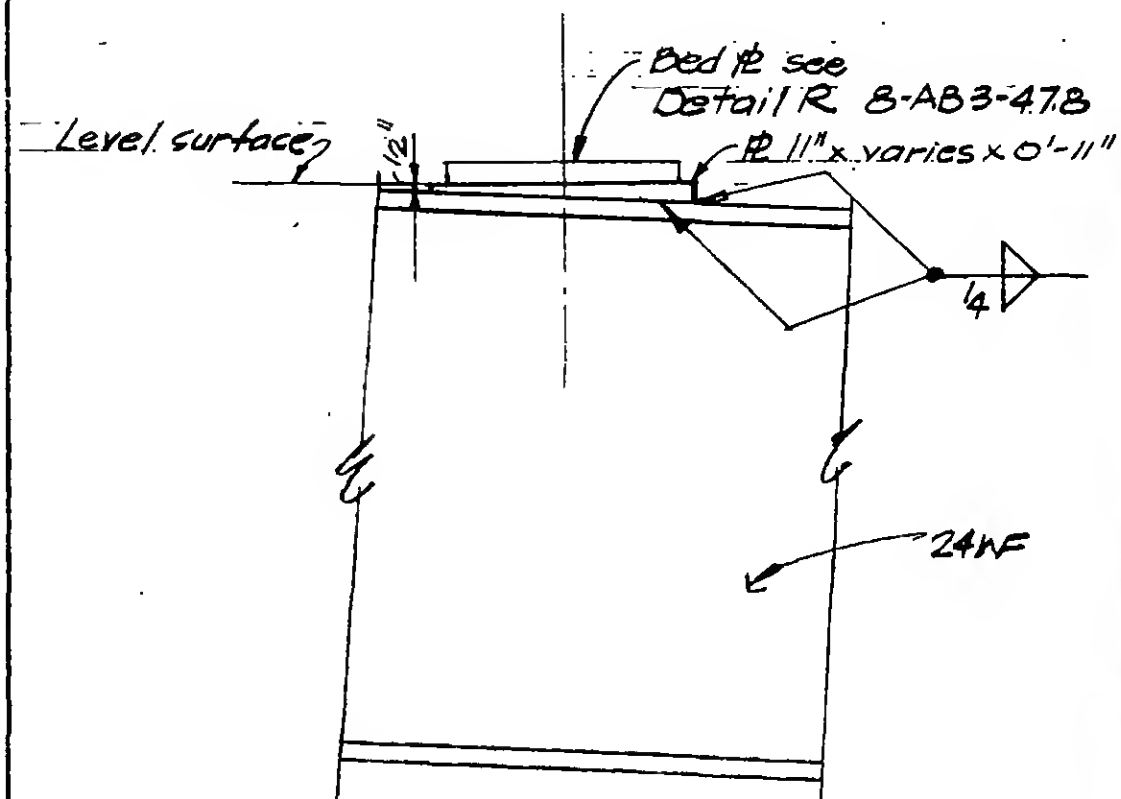
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MODIFICATIONS TO EL 332 FRAMING

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Detail ADetail B

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3.5 Details at Center Support.
3.6 Details at Center Support.

General Notes - Structural Steel

1. All construction shall be in accordance with Basic Project Specifications.
2. See SK-102 for Framing Plan at North and Center Supports.

End +
Microfilm version



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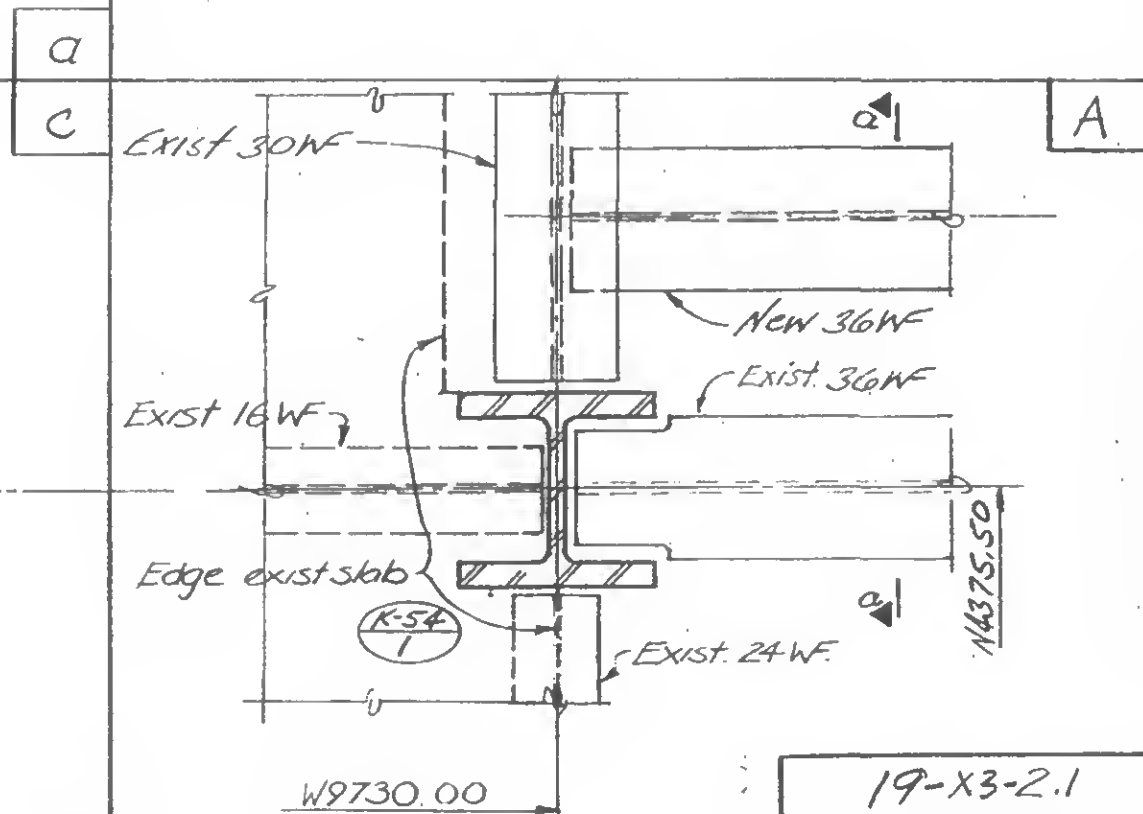
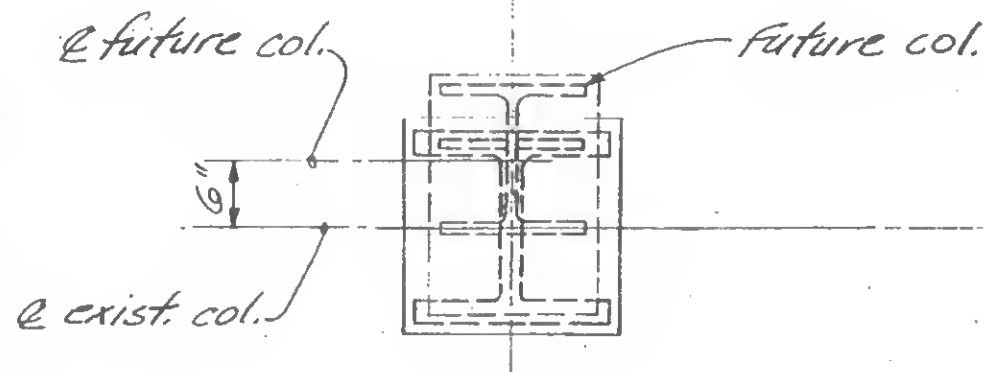
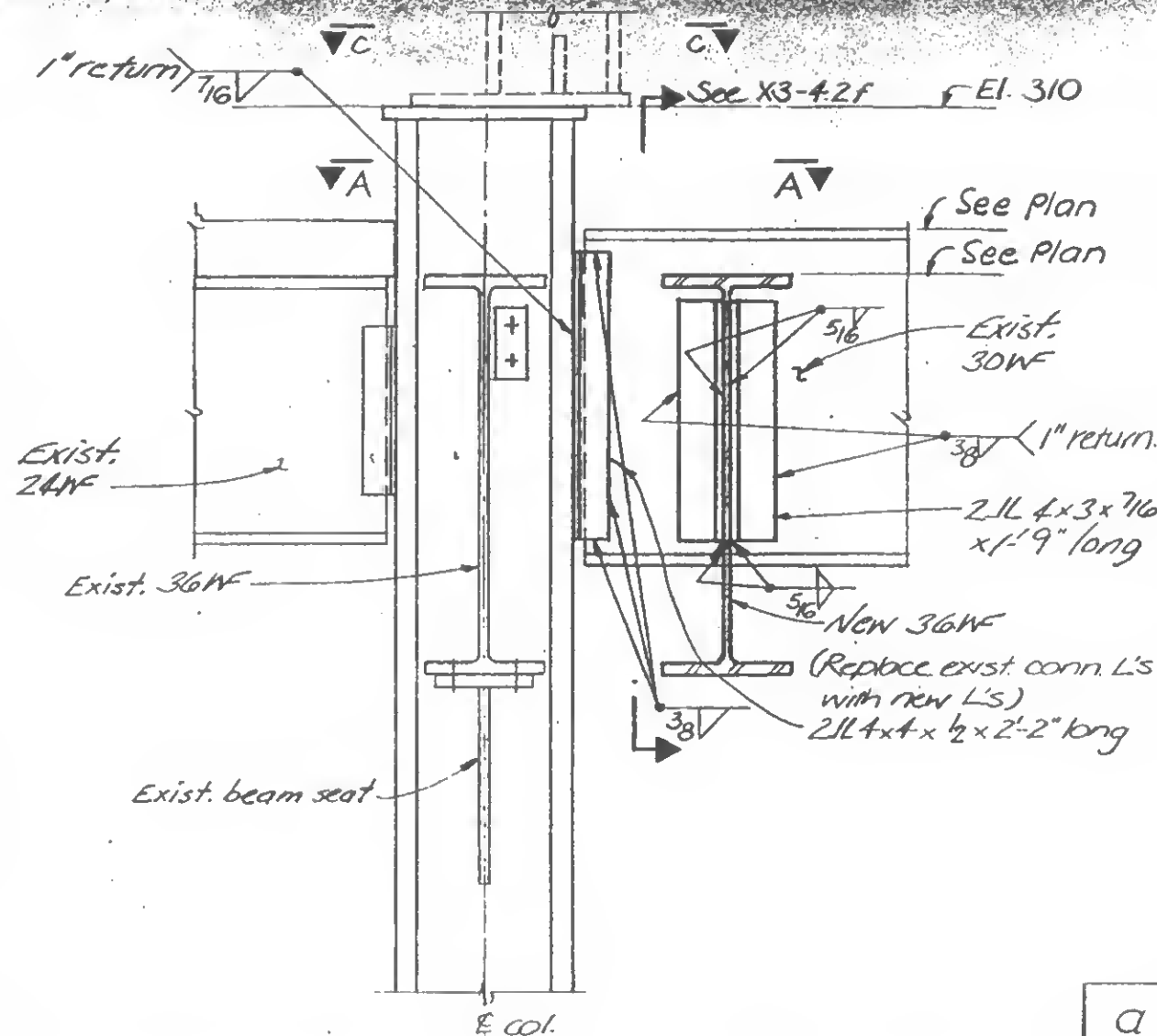
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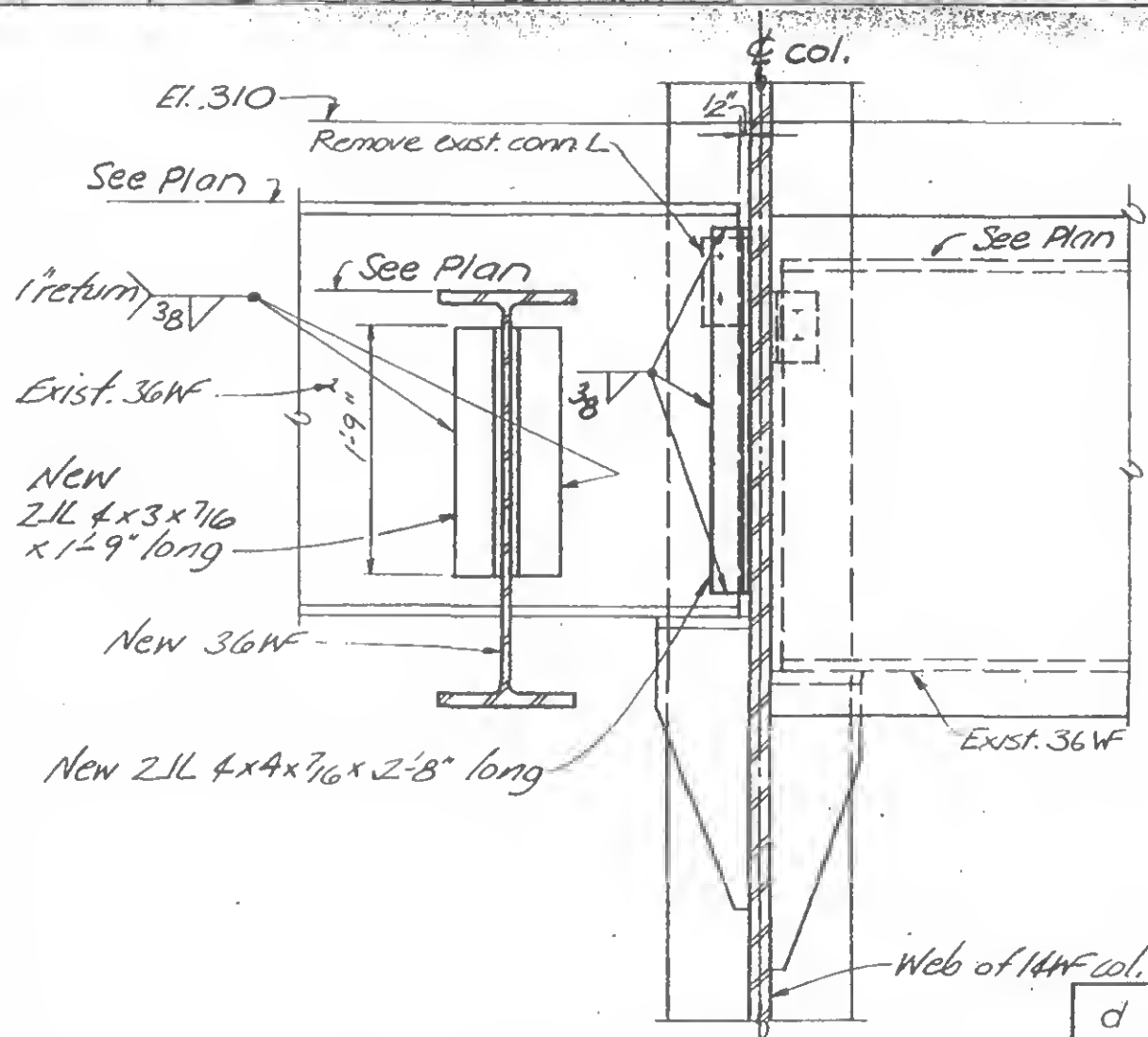
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WORLD TRADE CENTER-MODIFICATION

TITLE NORTH SUPPORT

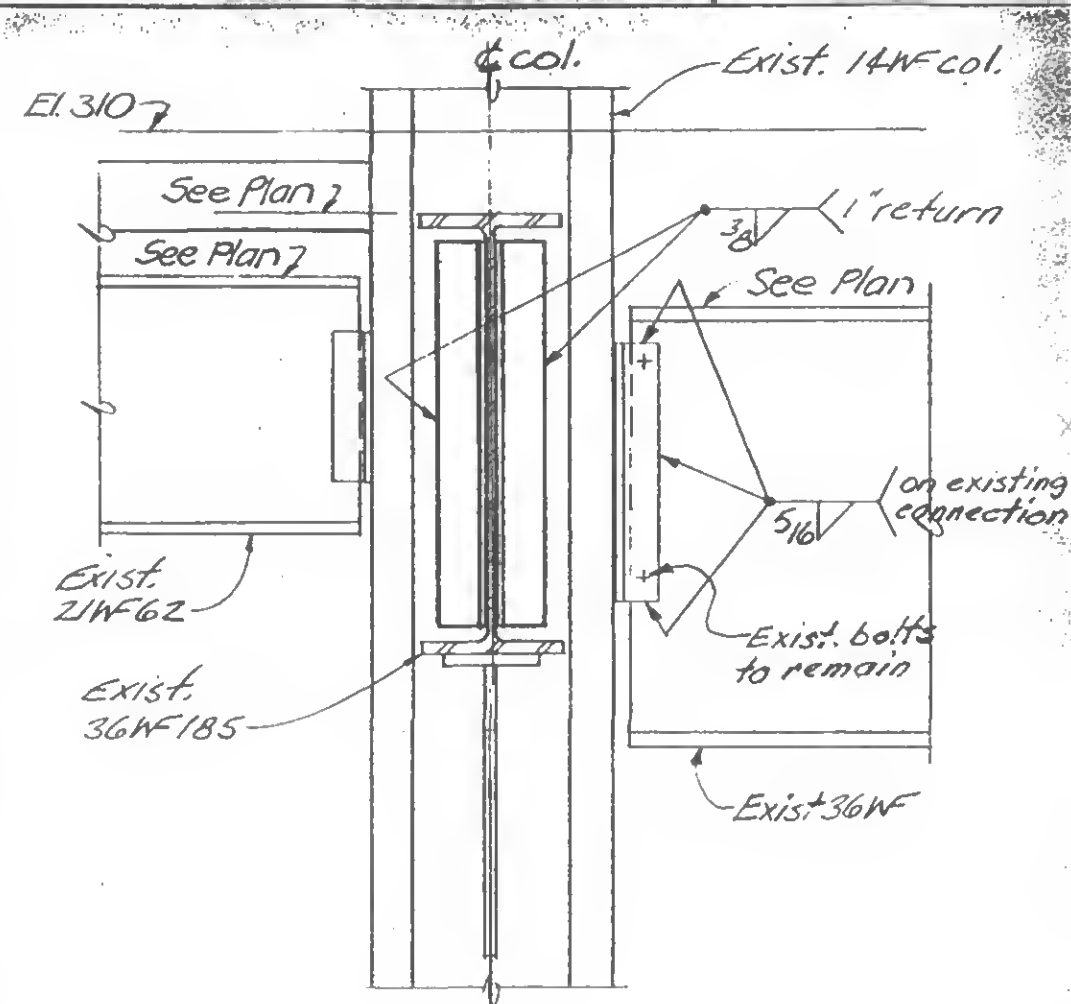
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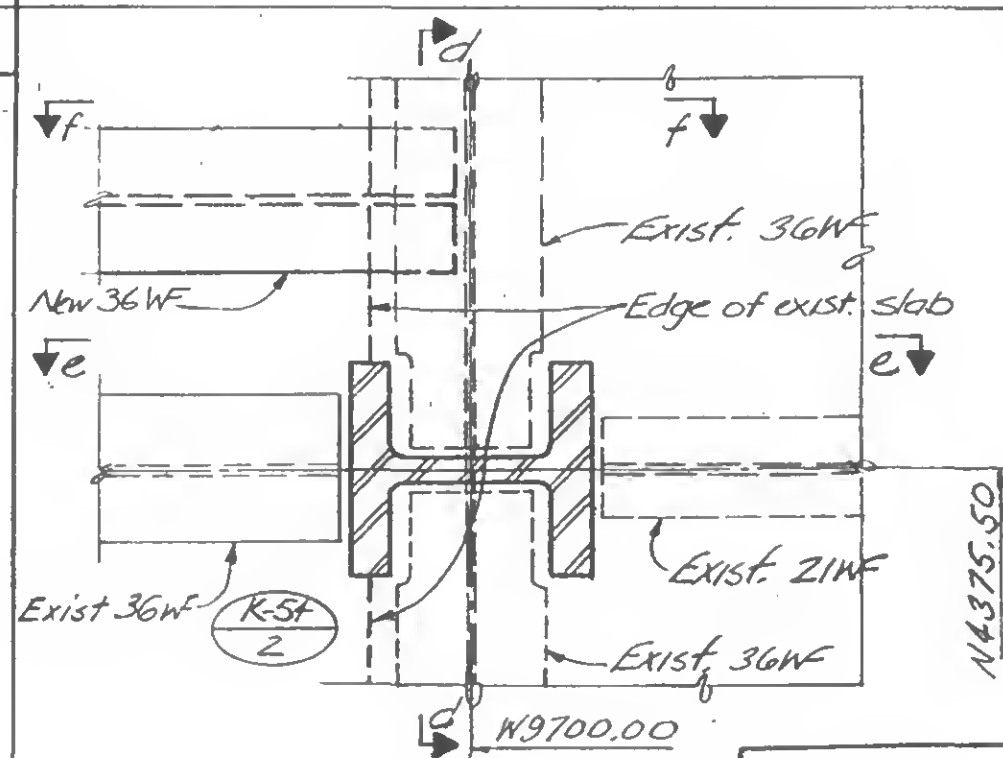
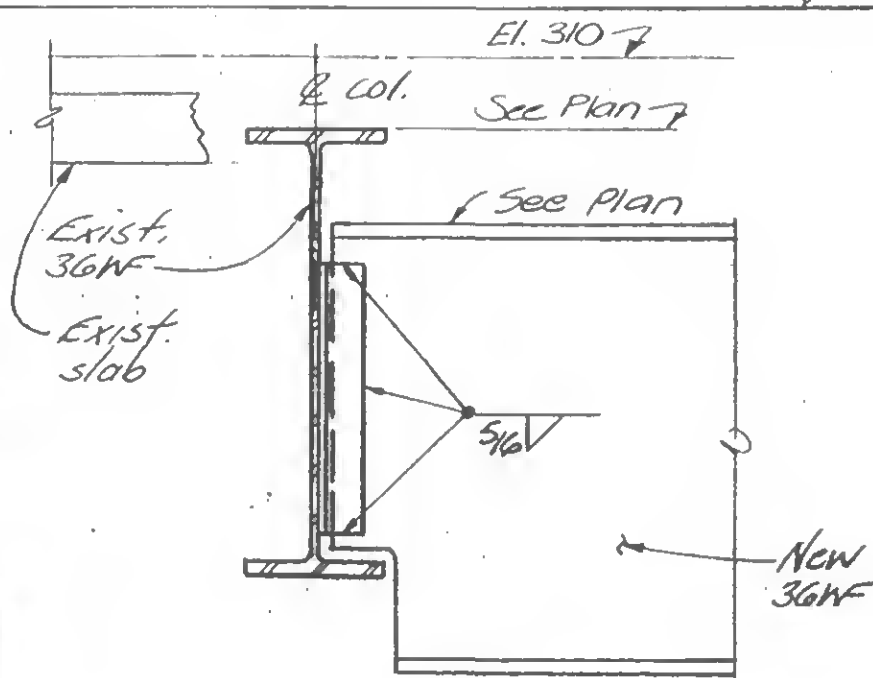
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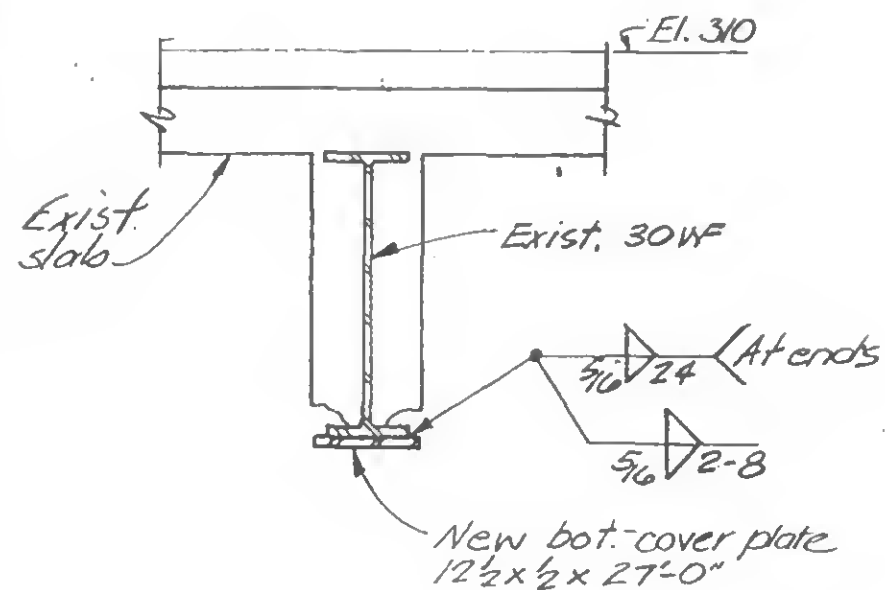
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WORLD TRADE CENTER - MODIFICATION

TITLE: NORTH SUPPORT

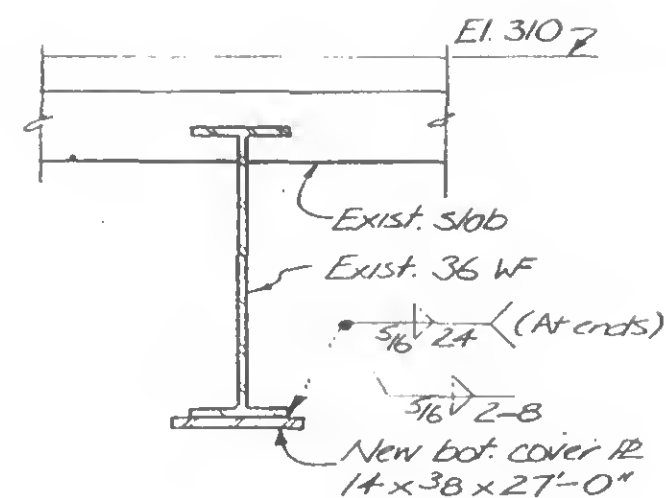
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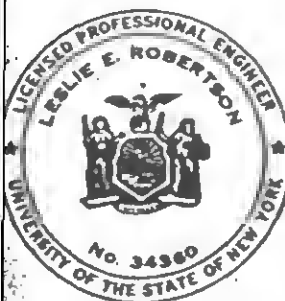
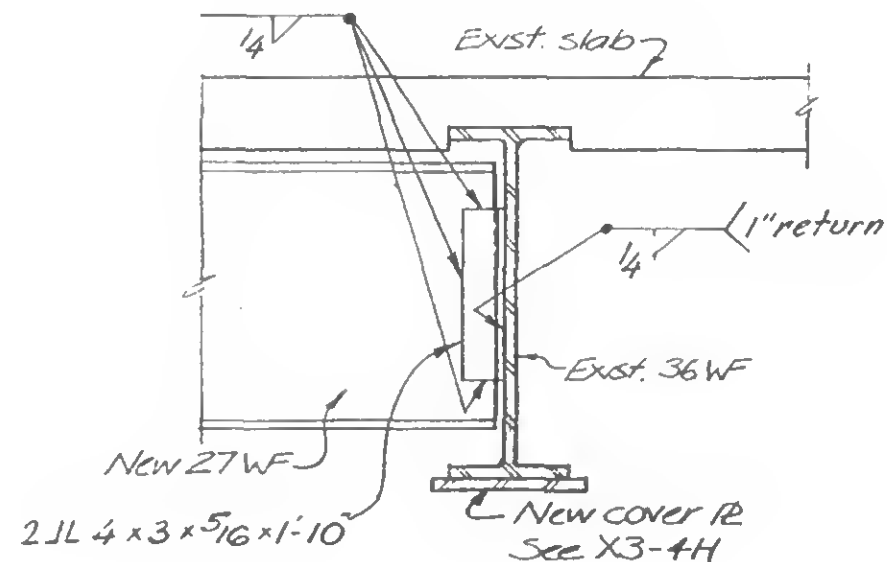
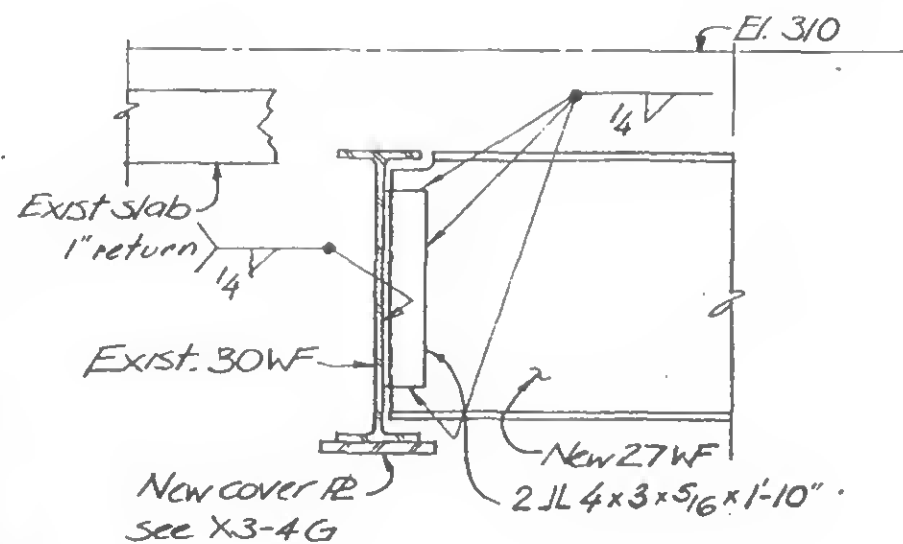
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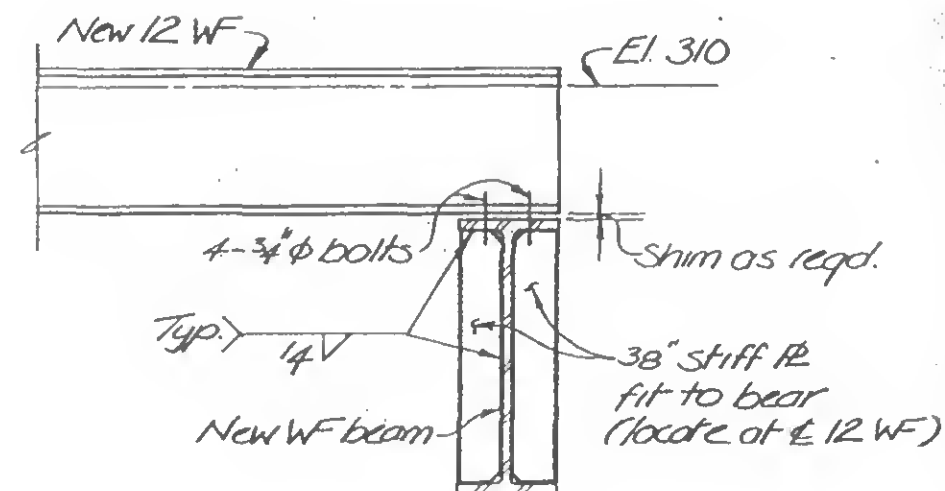
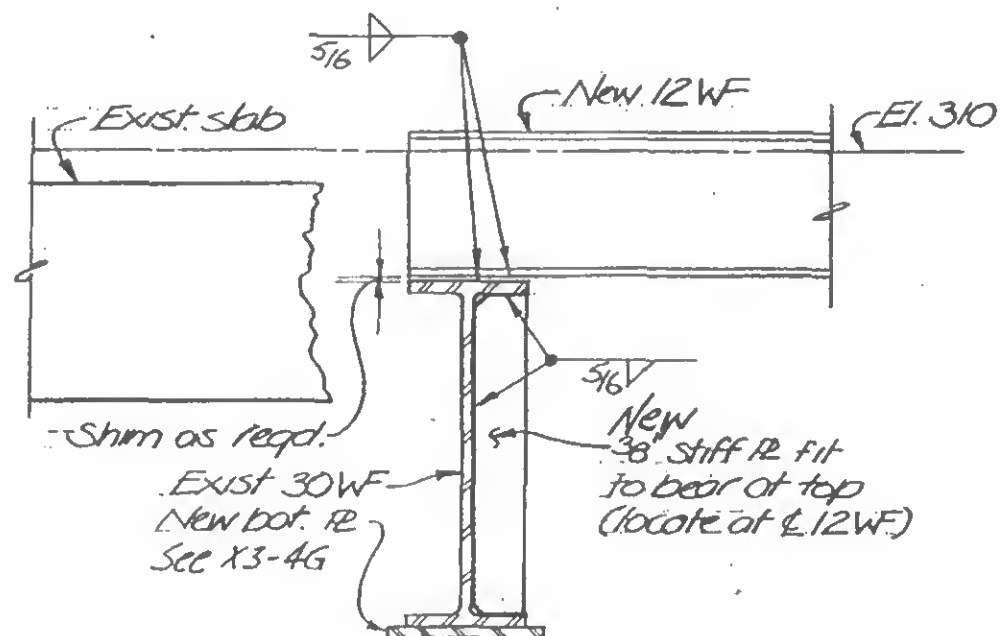
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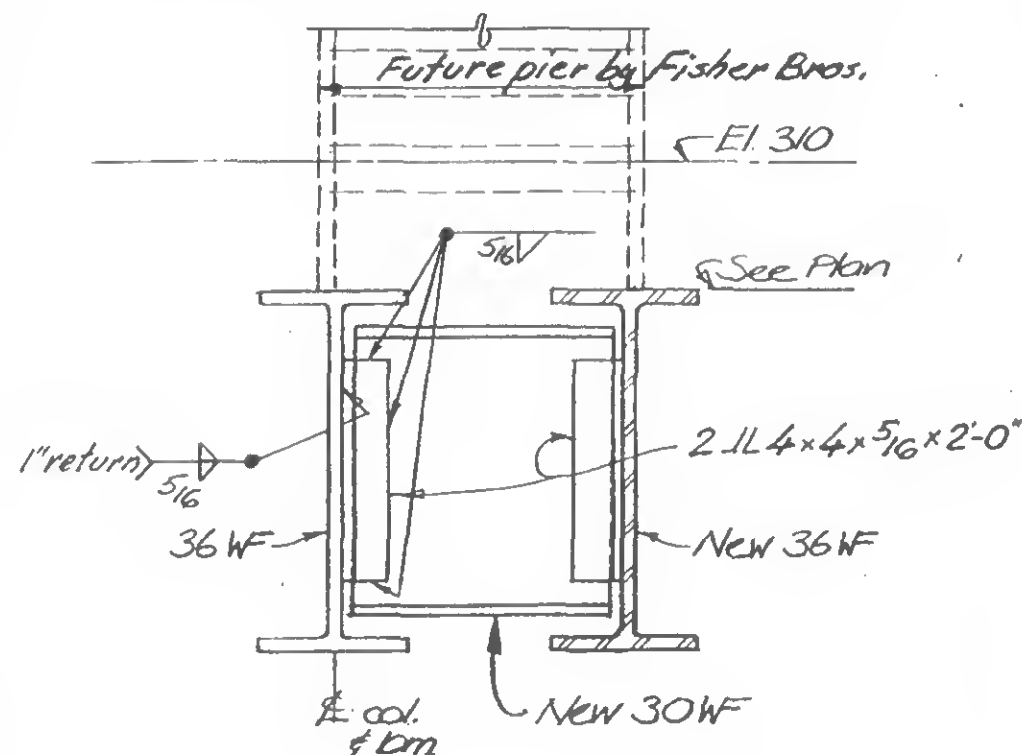
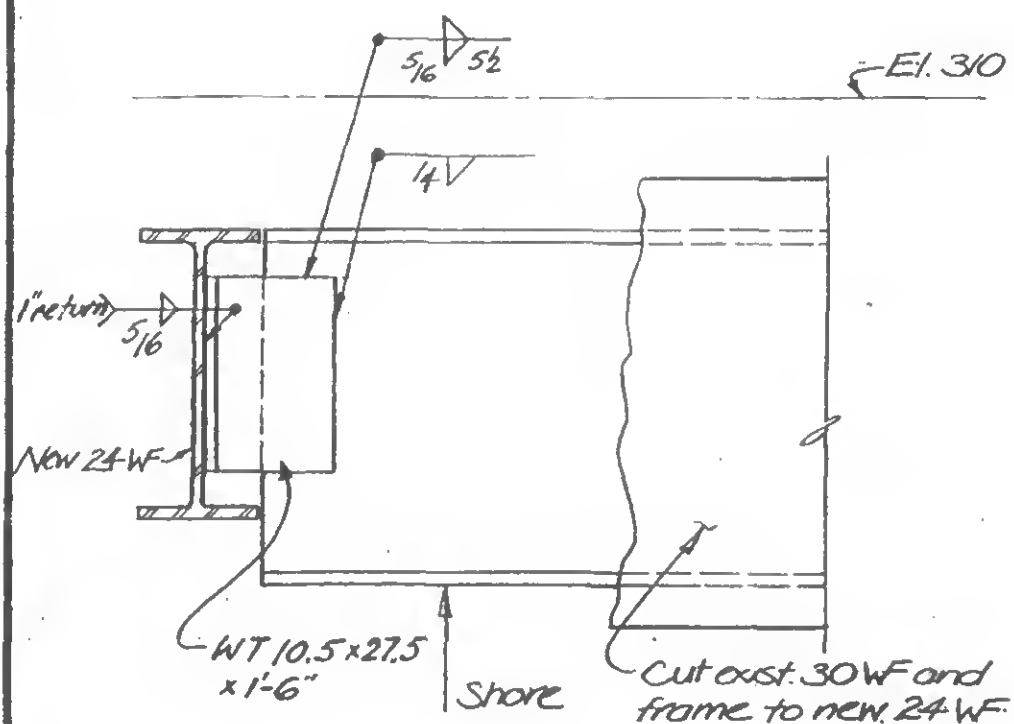


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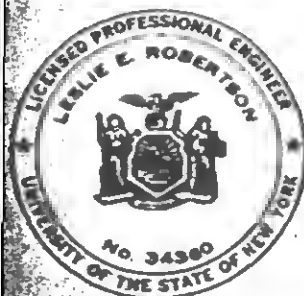
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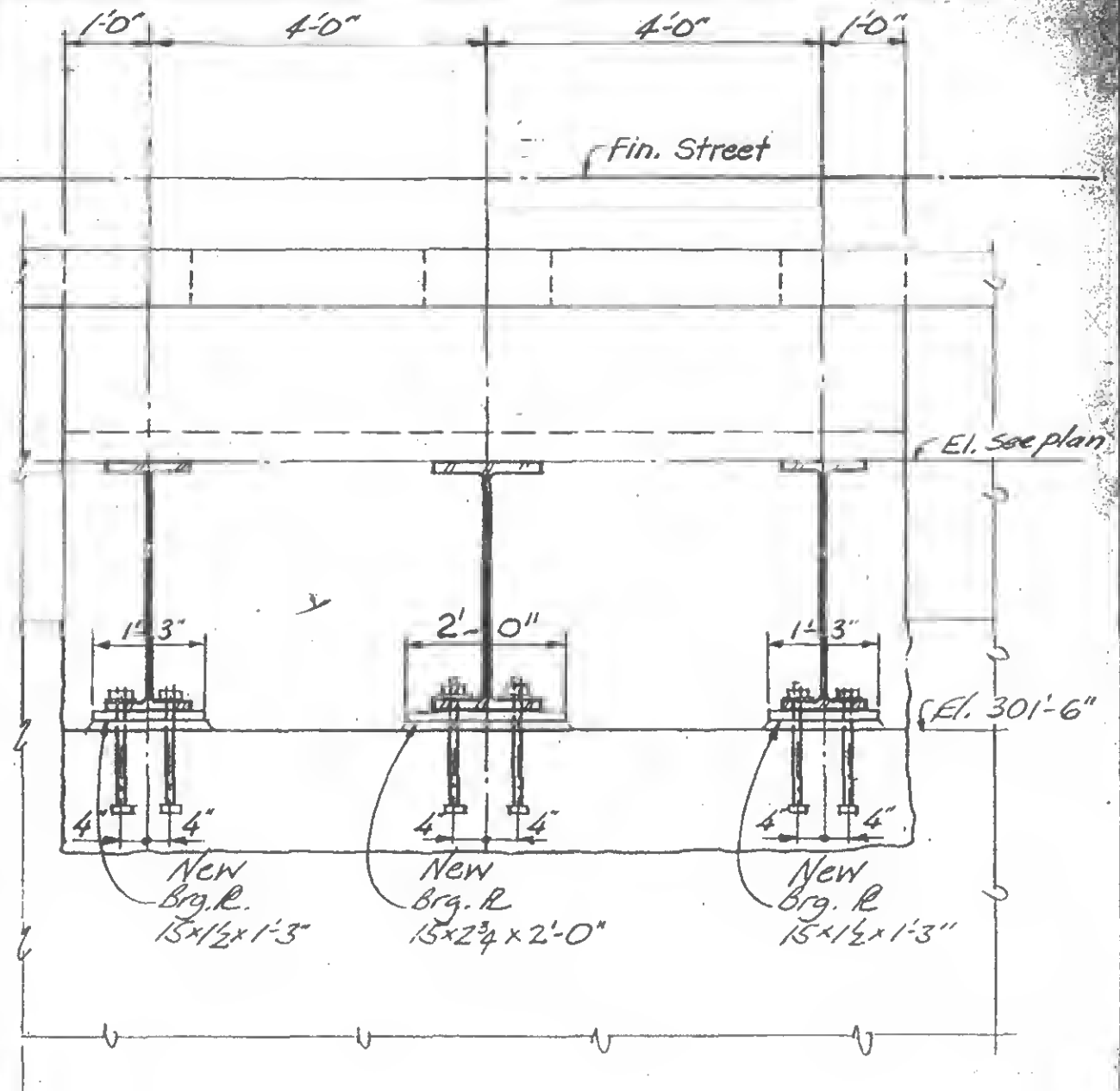
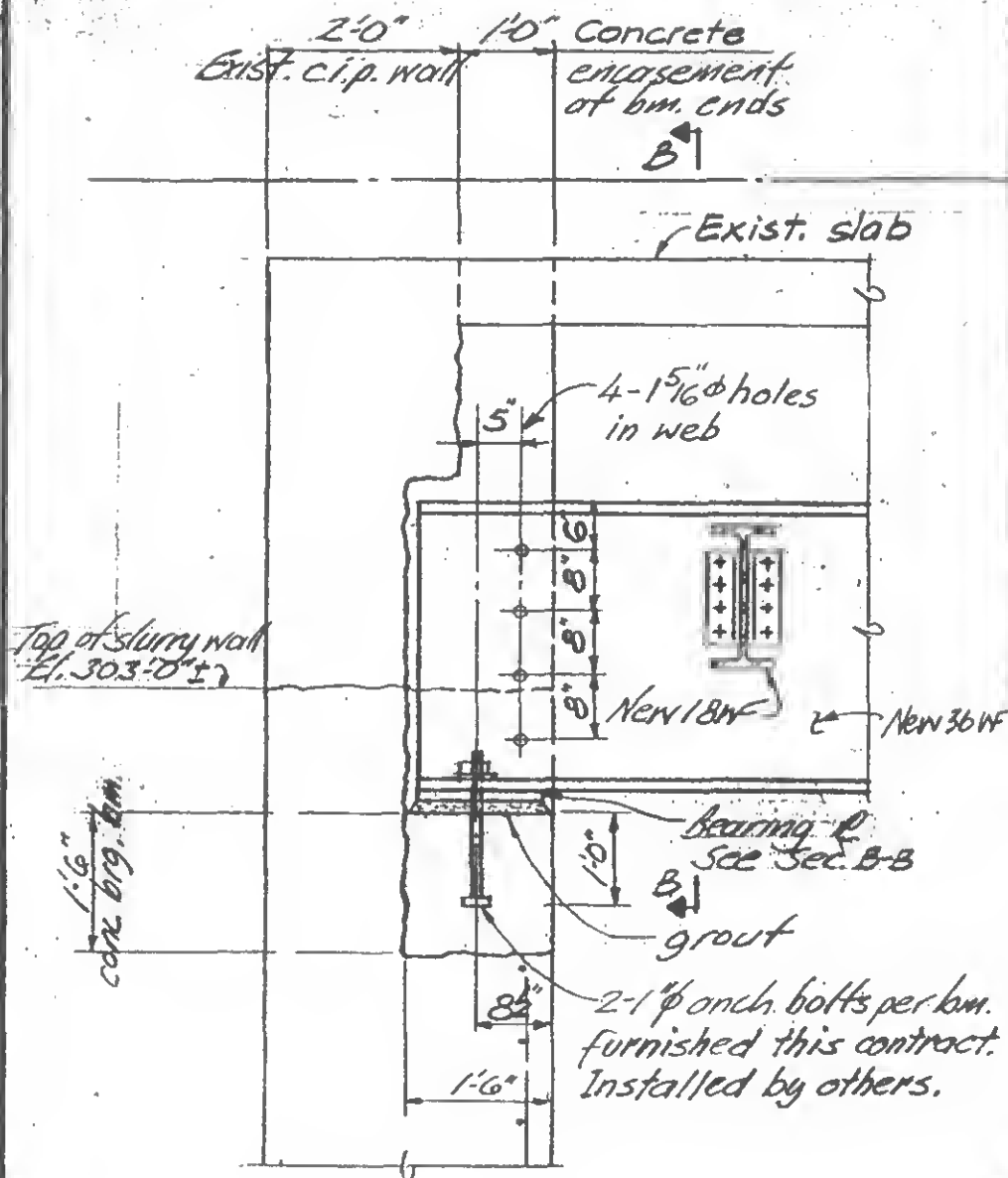
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PROJECT: LIBERTY STREET BRIDGE
WORLD TRADE CENTER - MODIFICATION

TITLE: CENTER PIER SUPPORT

DATE: 6-29-73

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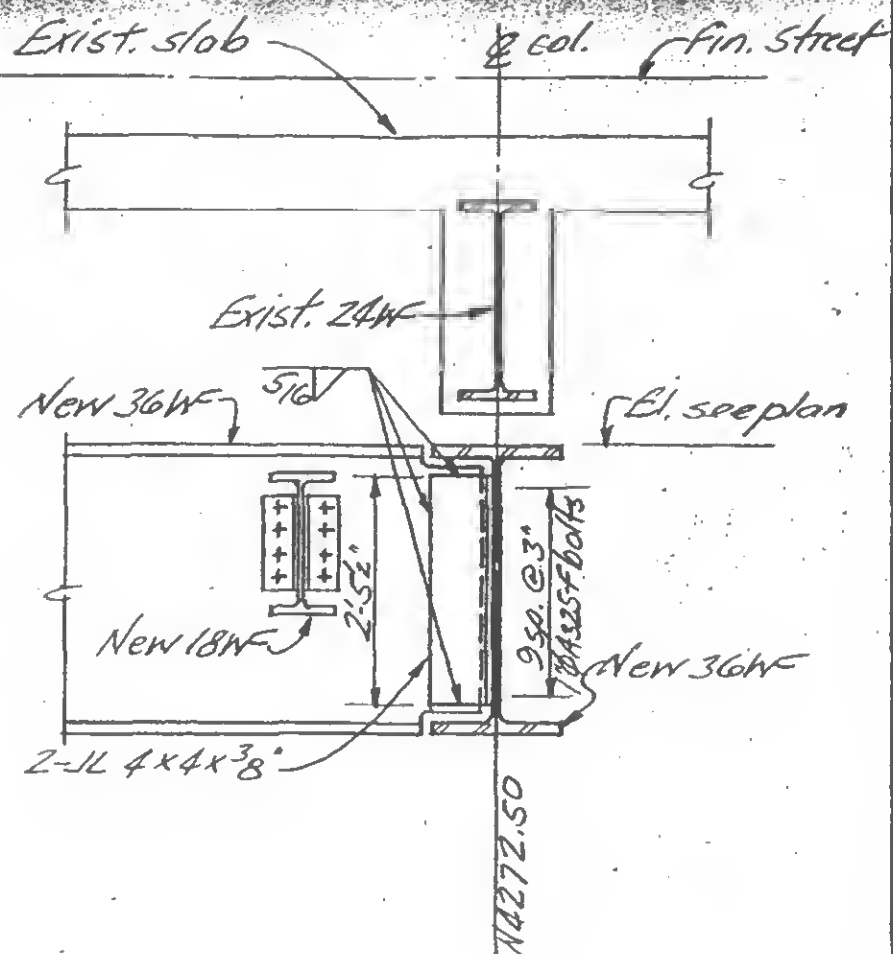
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LIBERTY STREET BRIDGE
WORLD TRADE CENTER MODIFICATION

CENTER PIER SUPPORT

DATE 6-29-73

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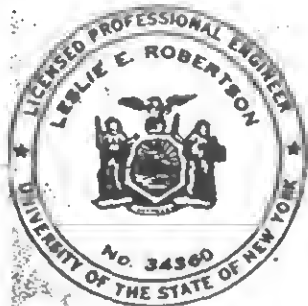
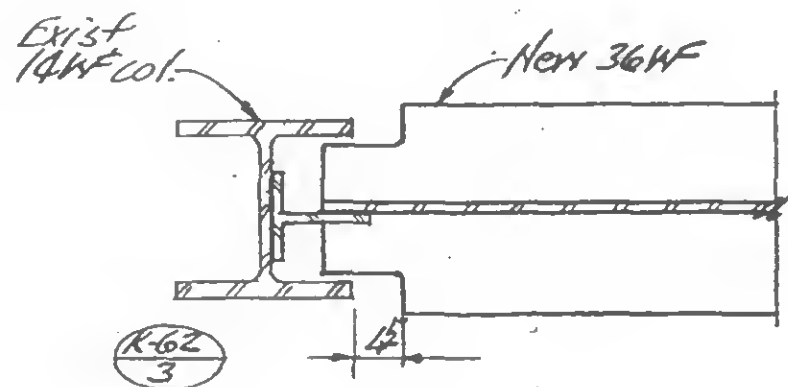
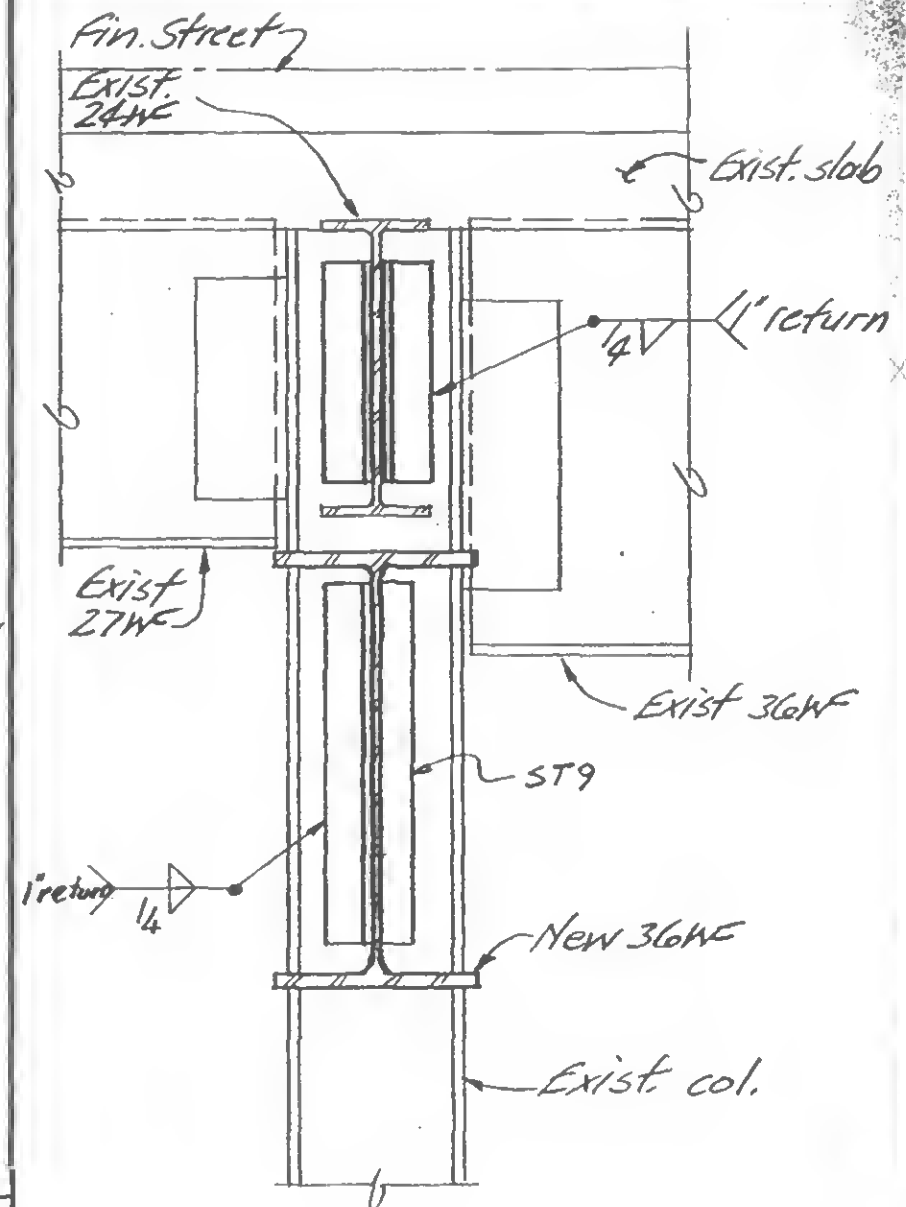
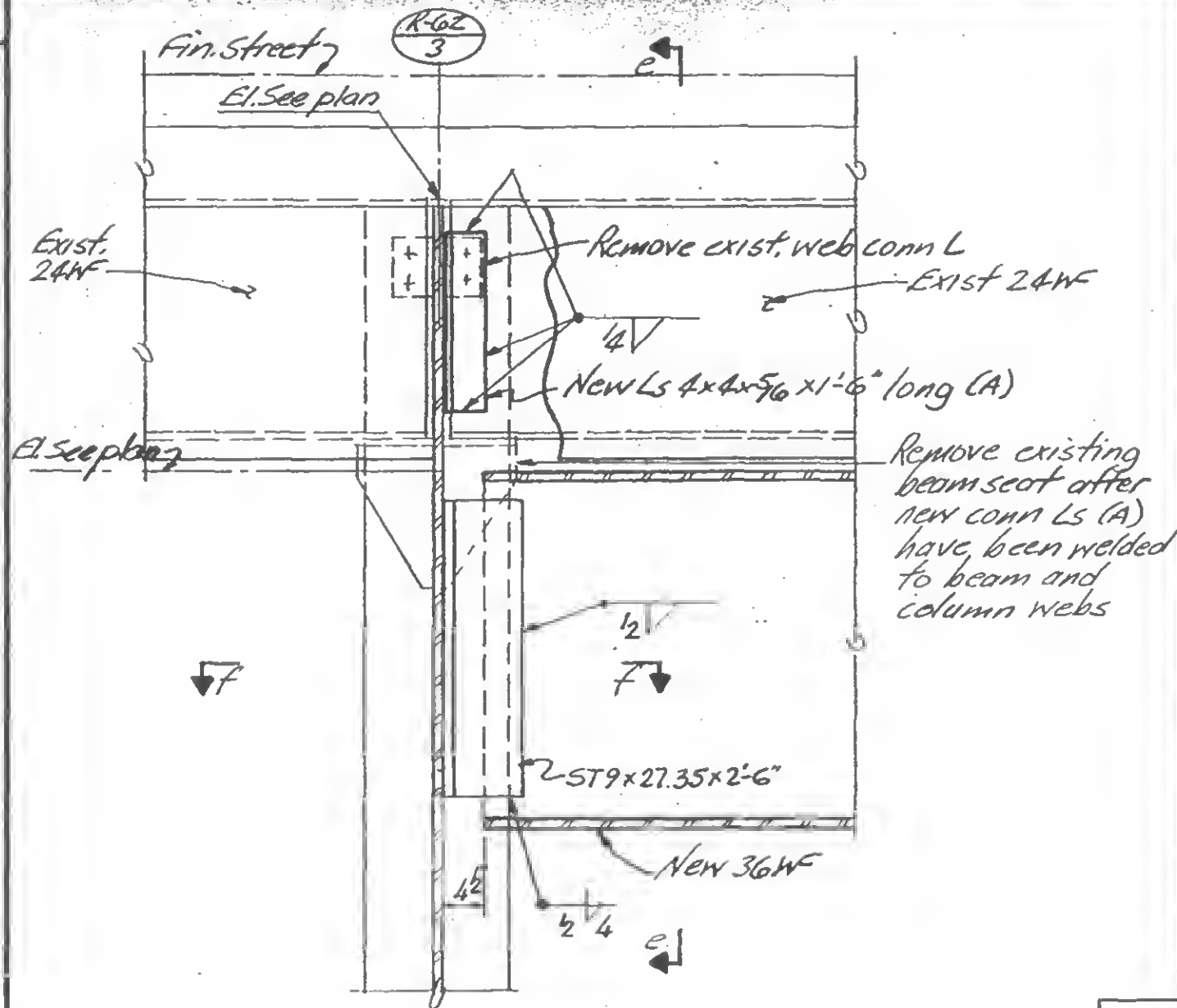
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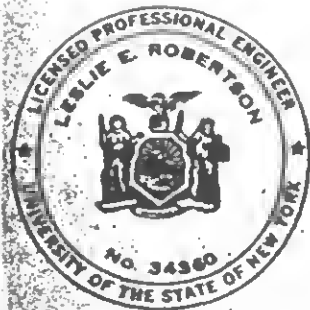
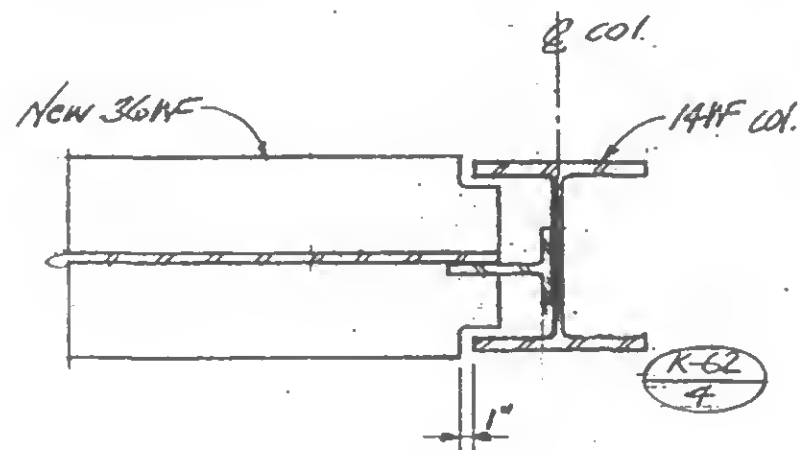
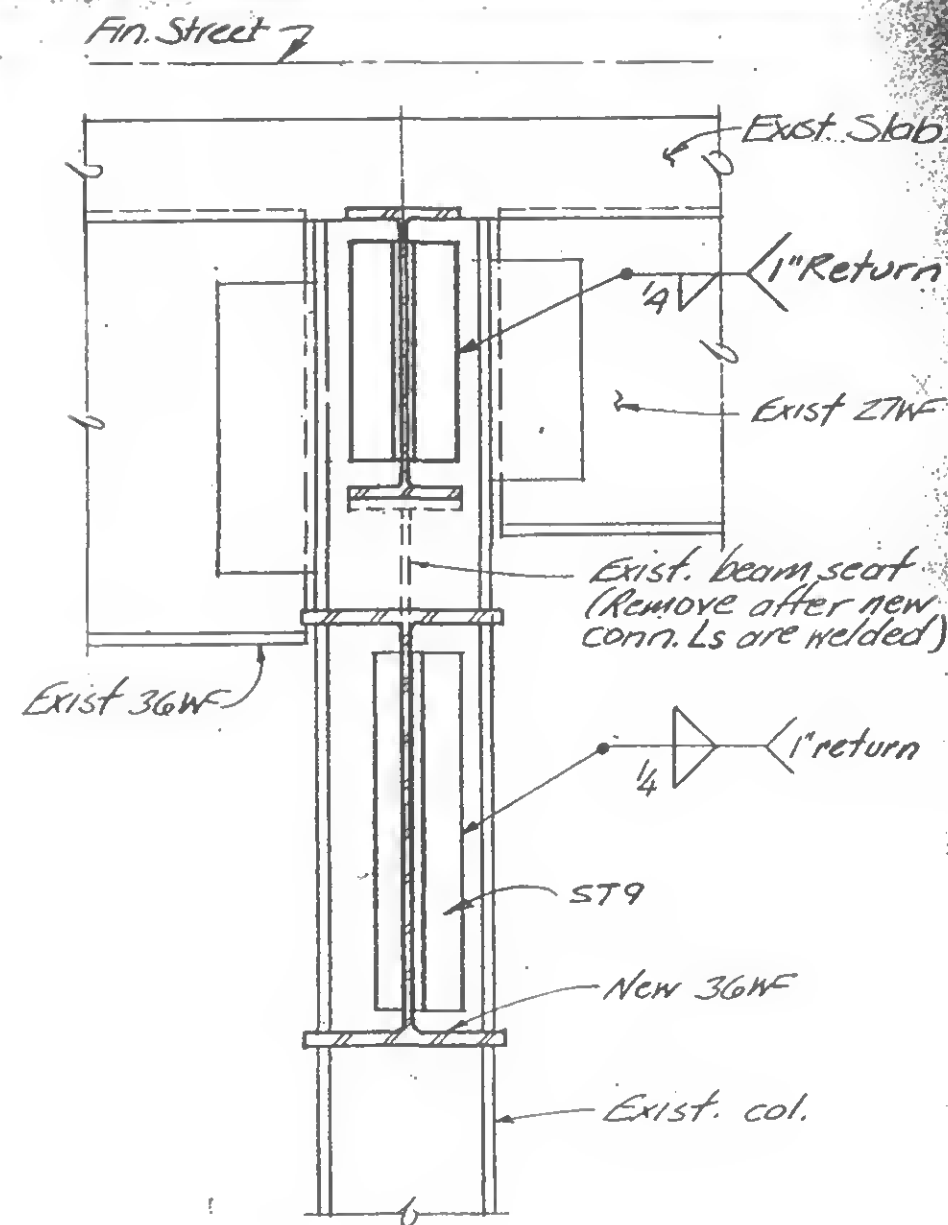
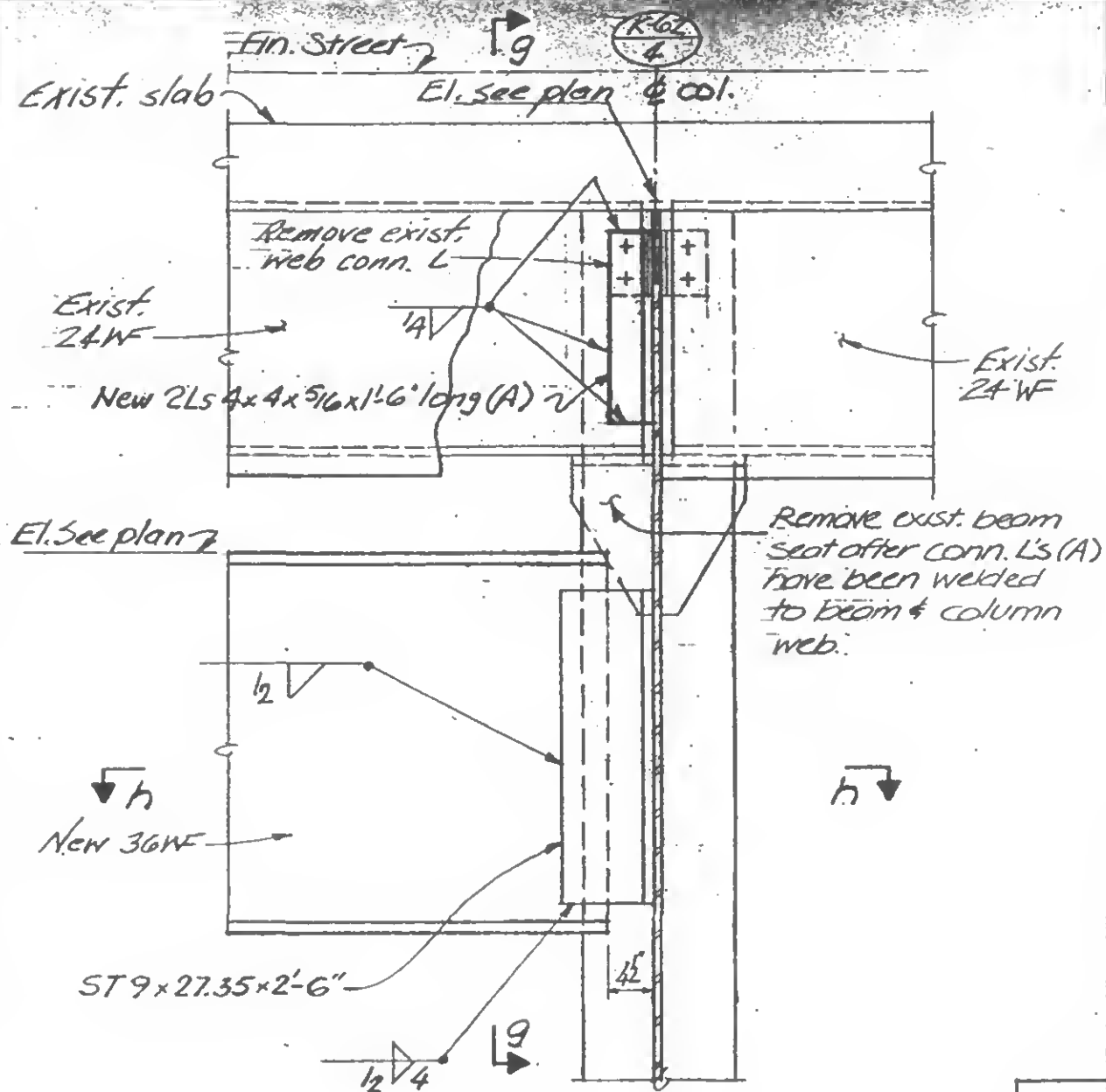
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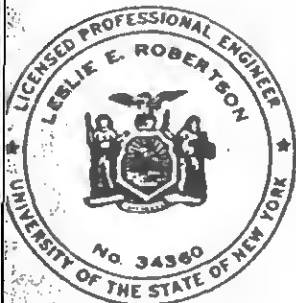
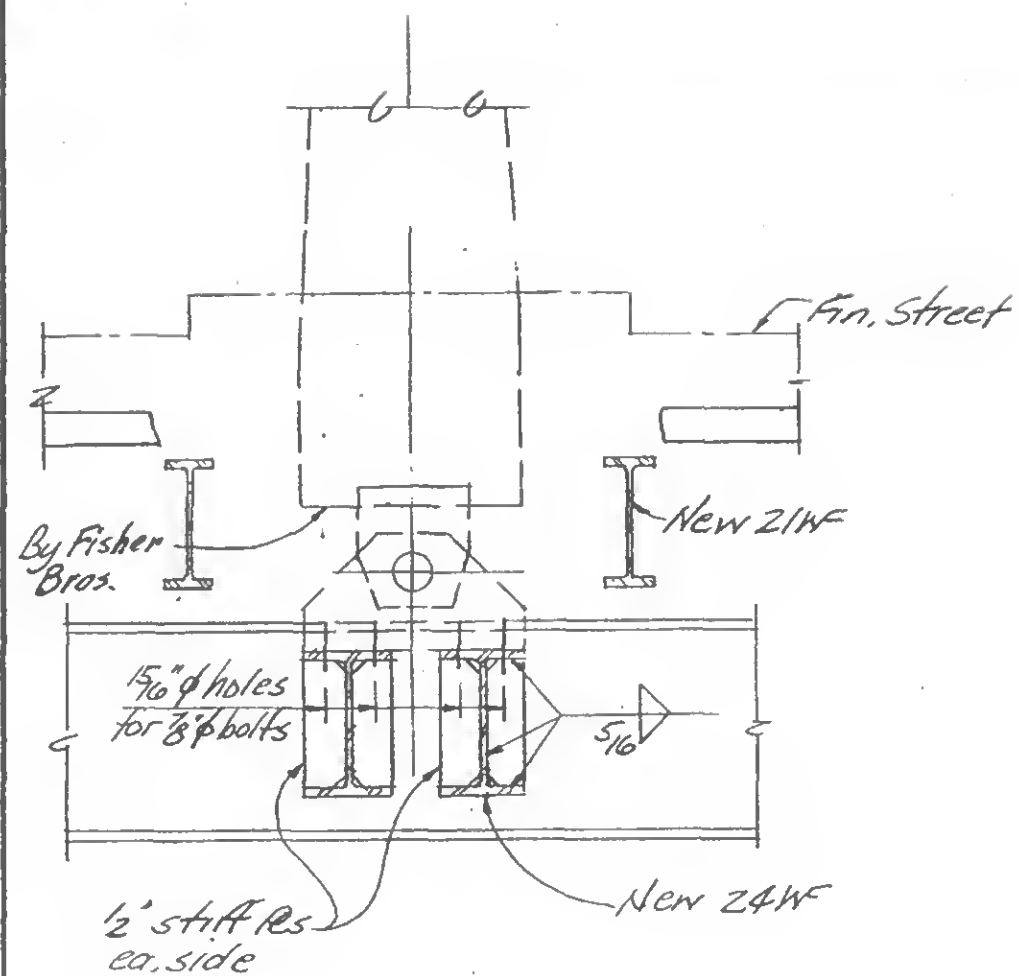
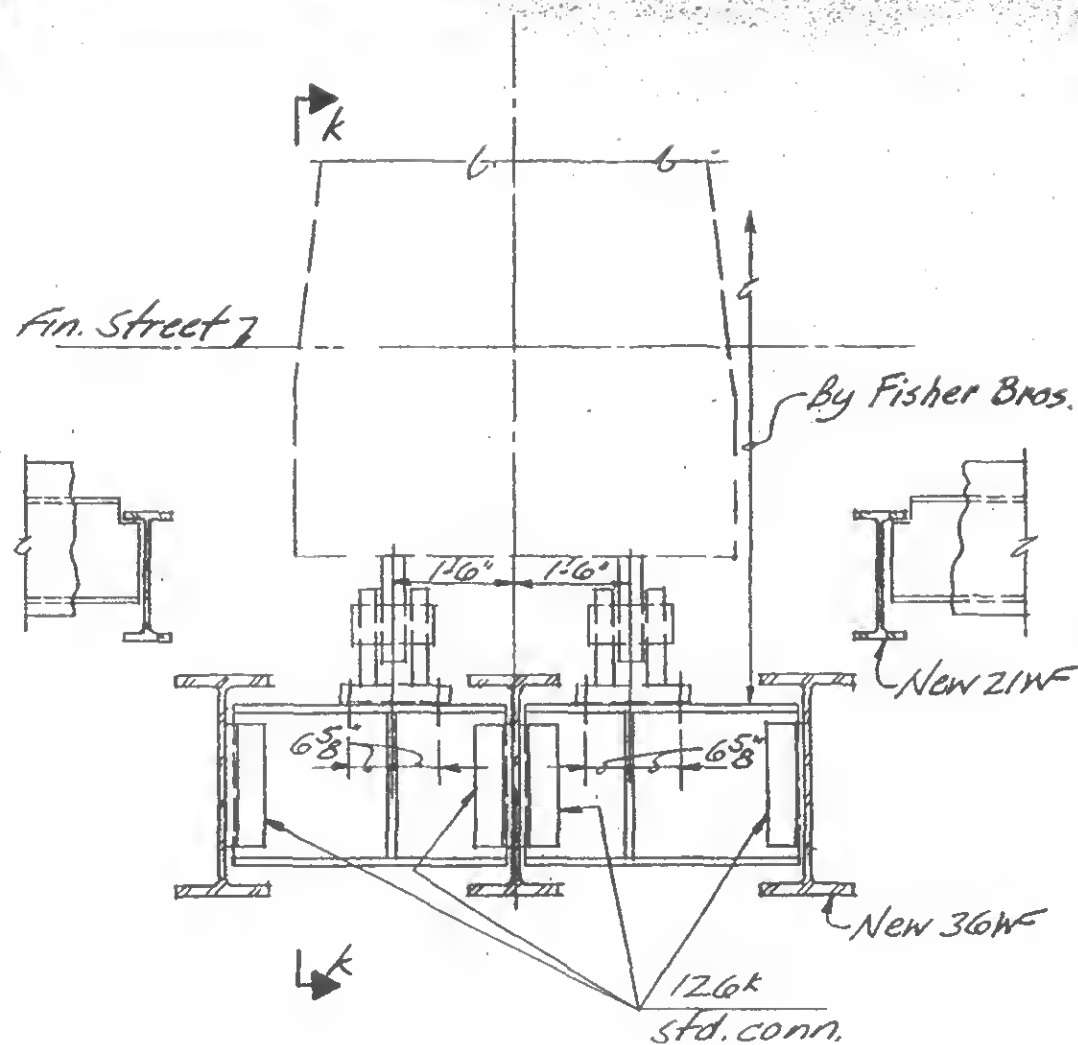
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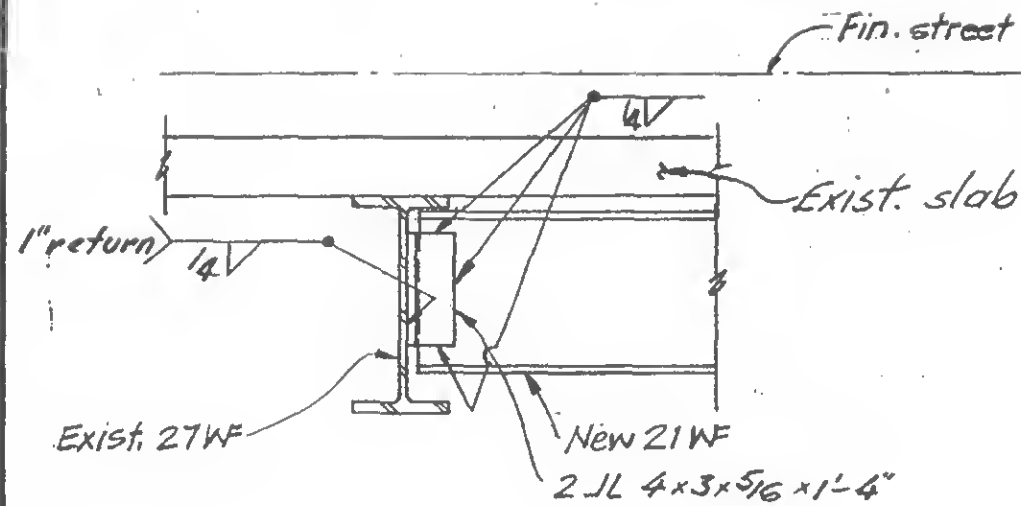
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PROJECT LIBERTY STREET BRIDGE
WORLD TRADE CENTER MODIFICATION

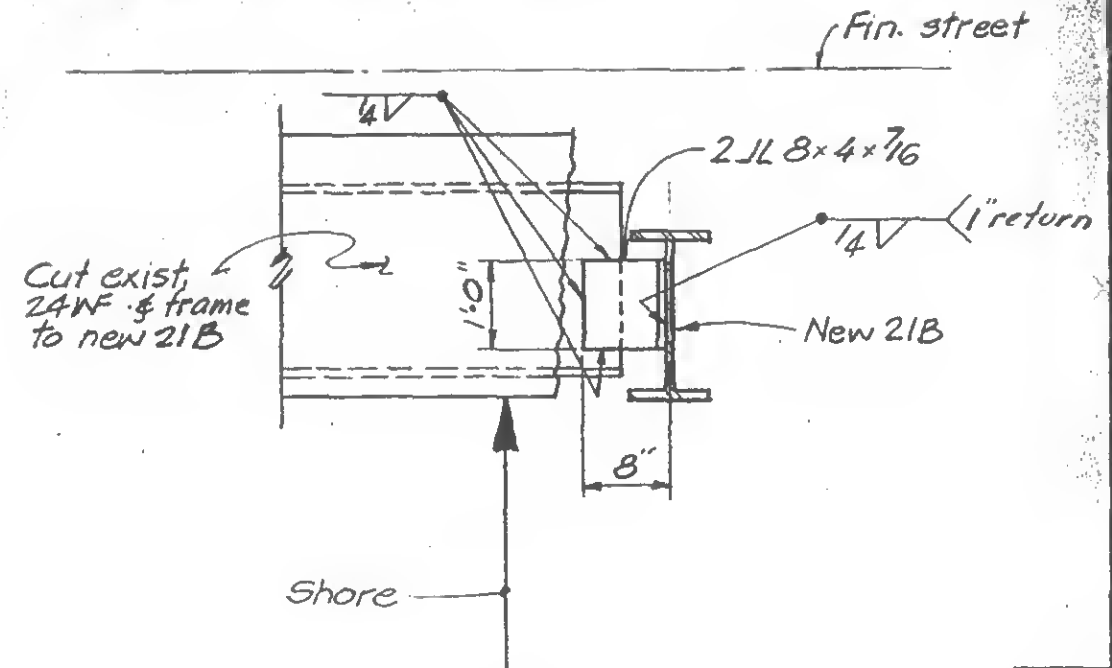
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DATE 6-29-73

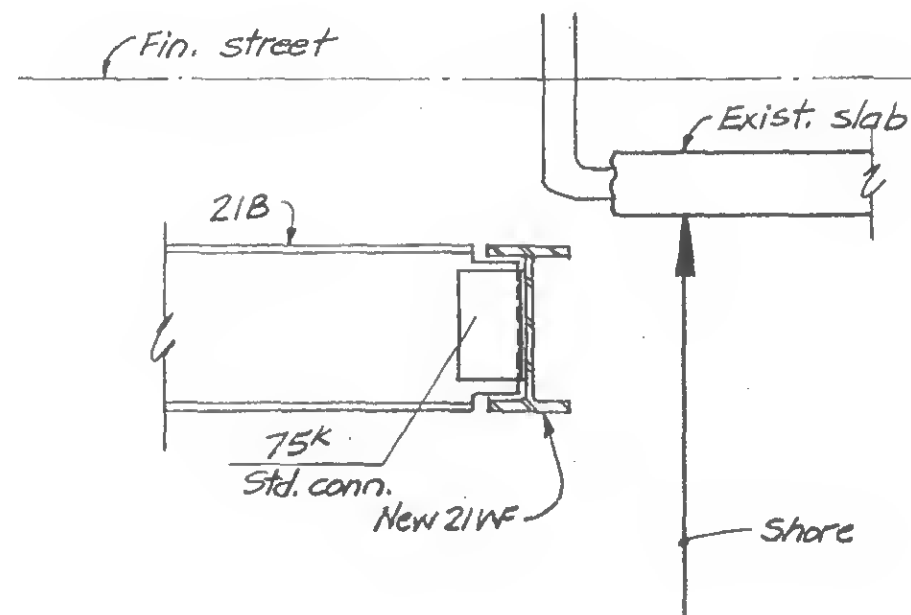
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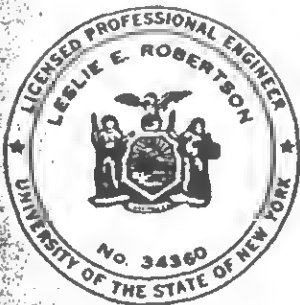


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General Notes - Concrete

1. All construction shall be in accordance with Basic Project Specifications.
2. See SCK-102 for framing Plan at North and Center Supports.
3. Remove existing concrete without damage to existing reinforcing.
4. Clean face of existing concrete and thoroughly coat entire surface with approved epoxy bonding compound prior to casting new concrete.
5. New concrete shall be approved "non-shrink," $f'_c = 4000$ psi stone aggregate concrete.

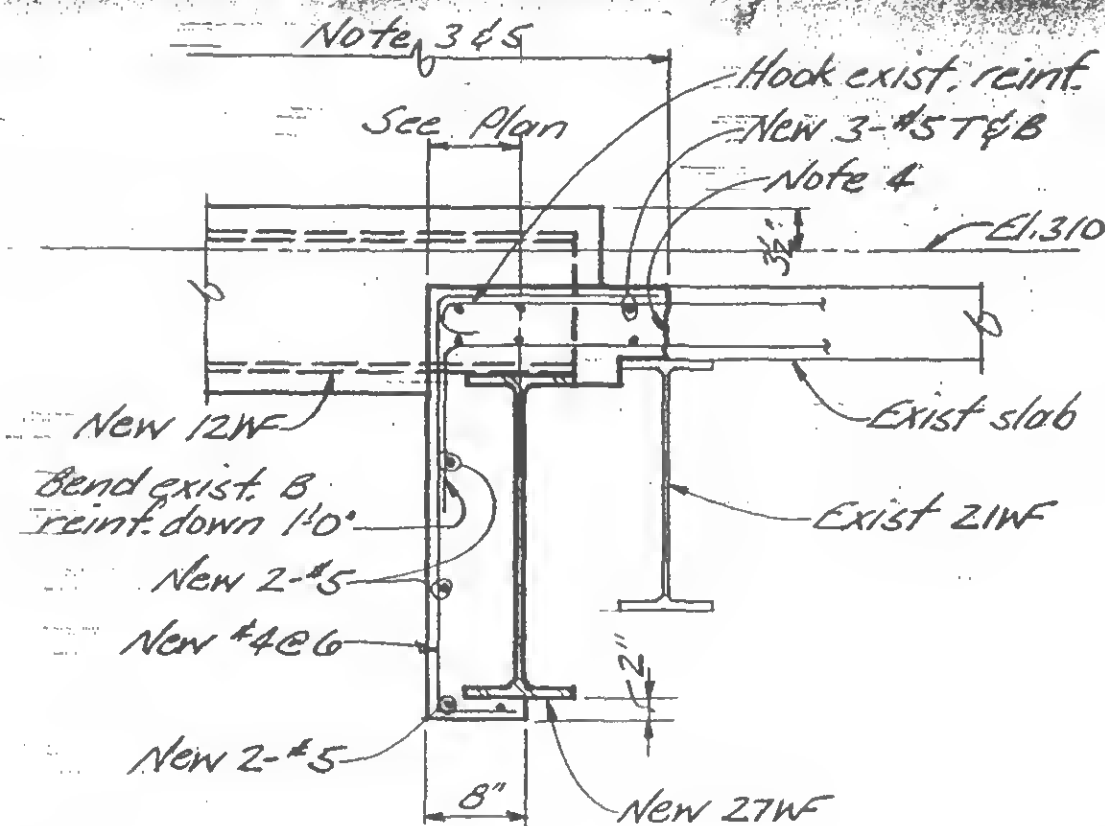
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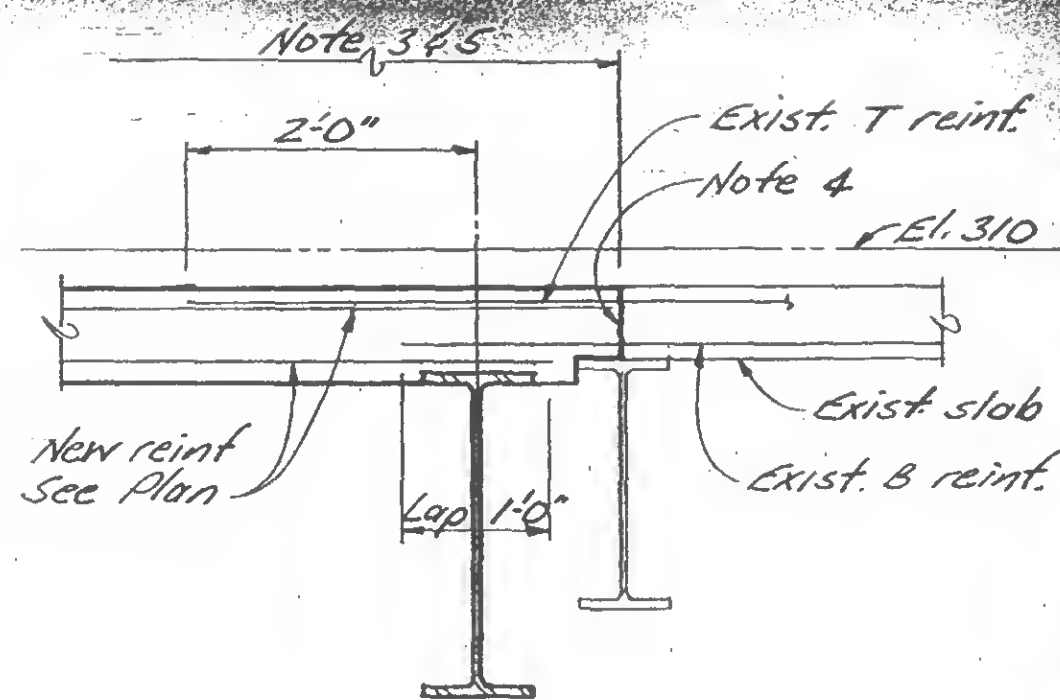
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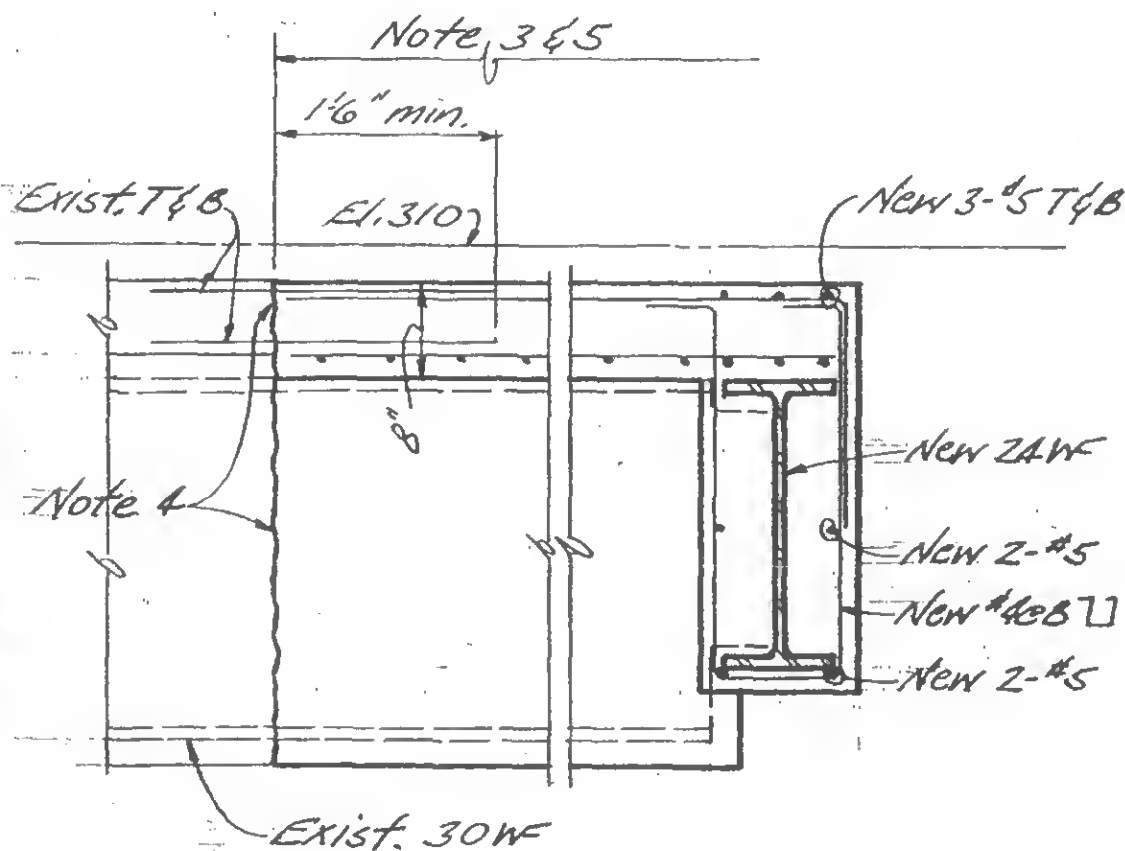
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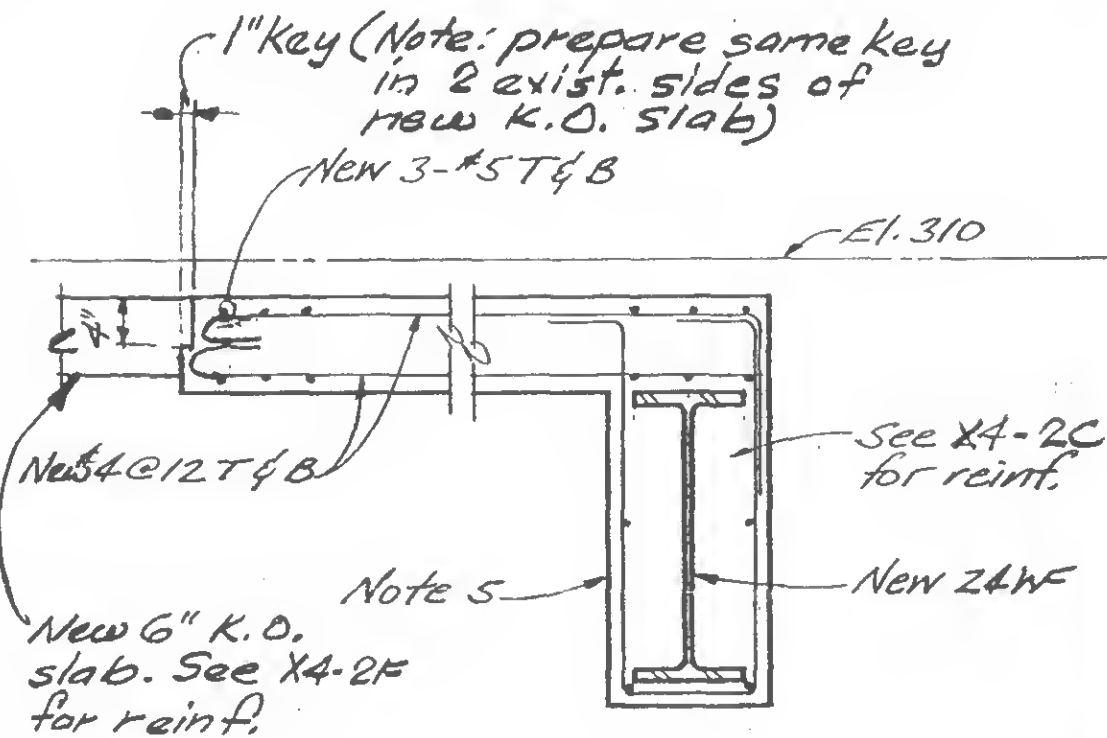
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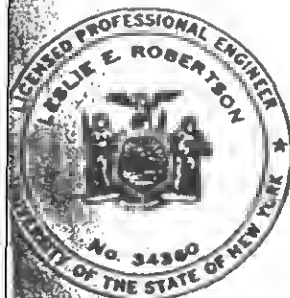


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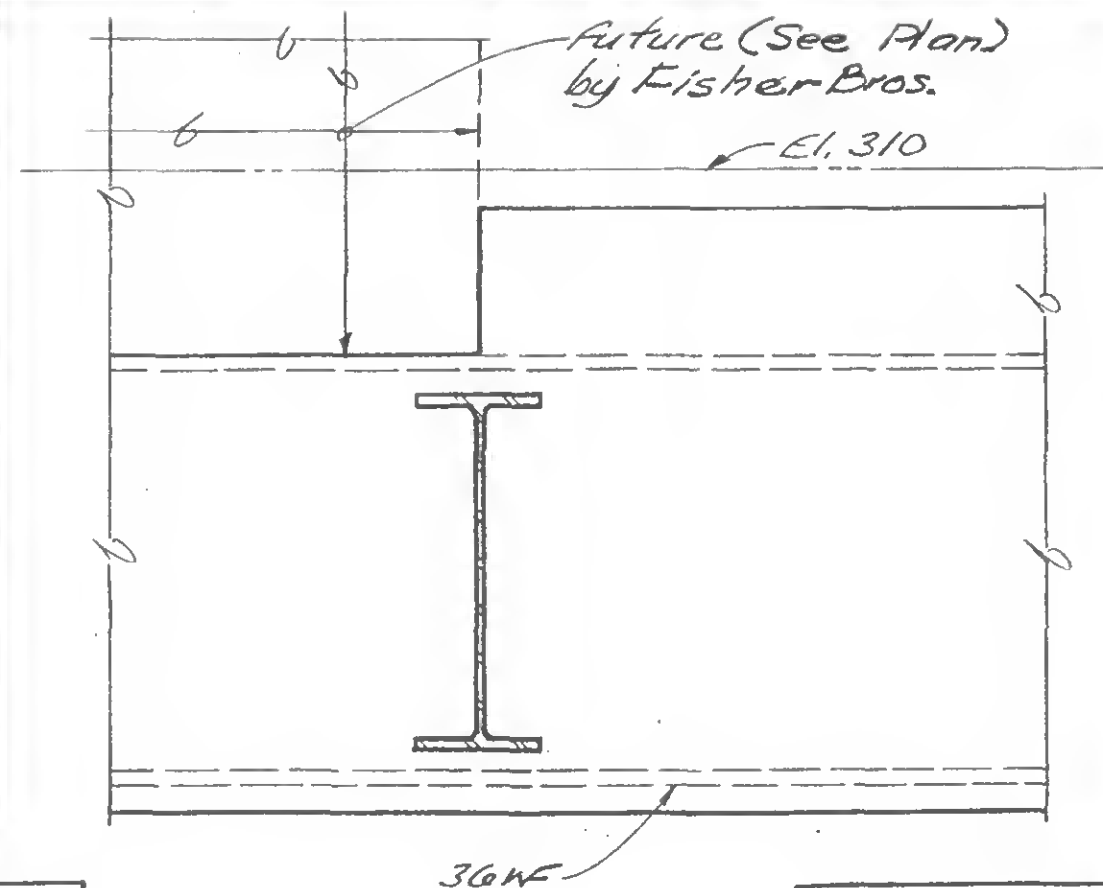
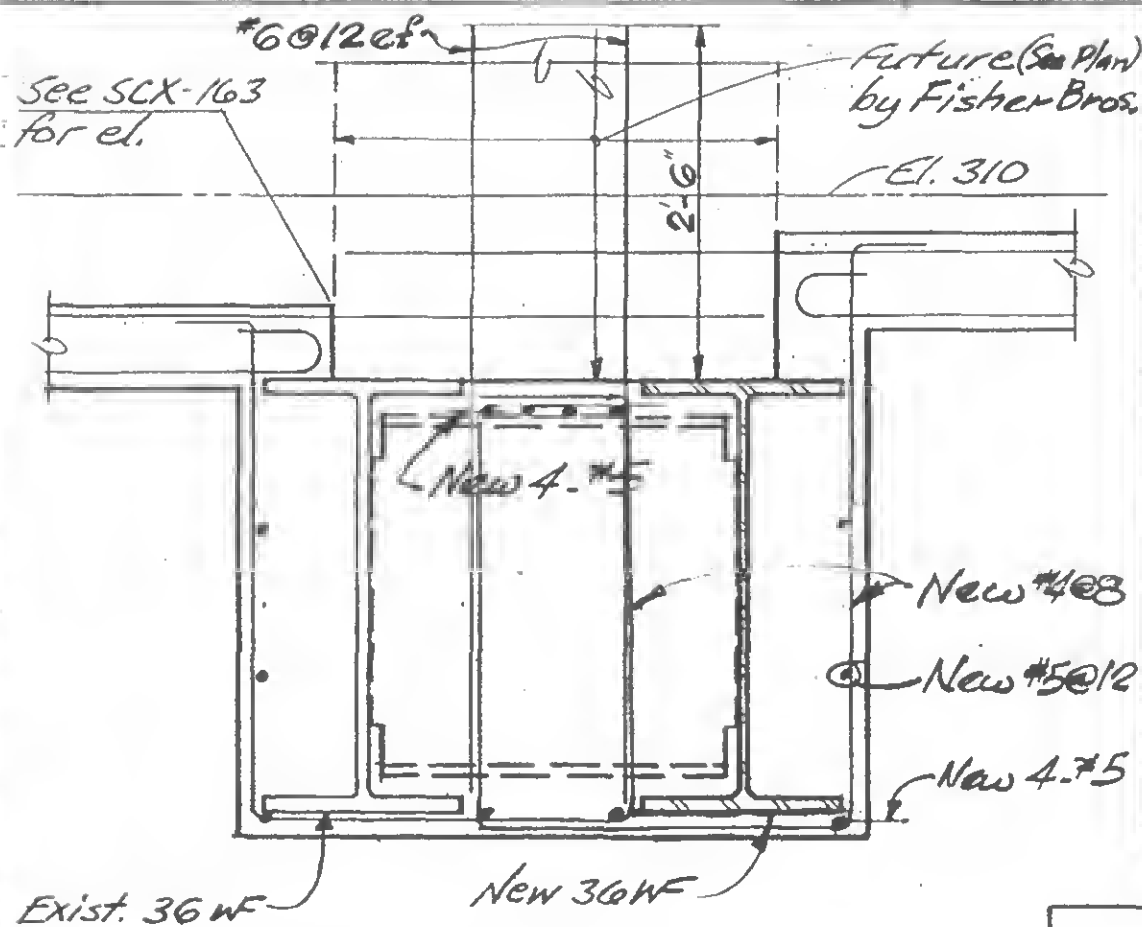
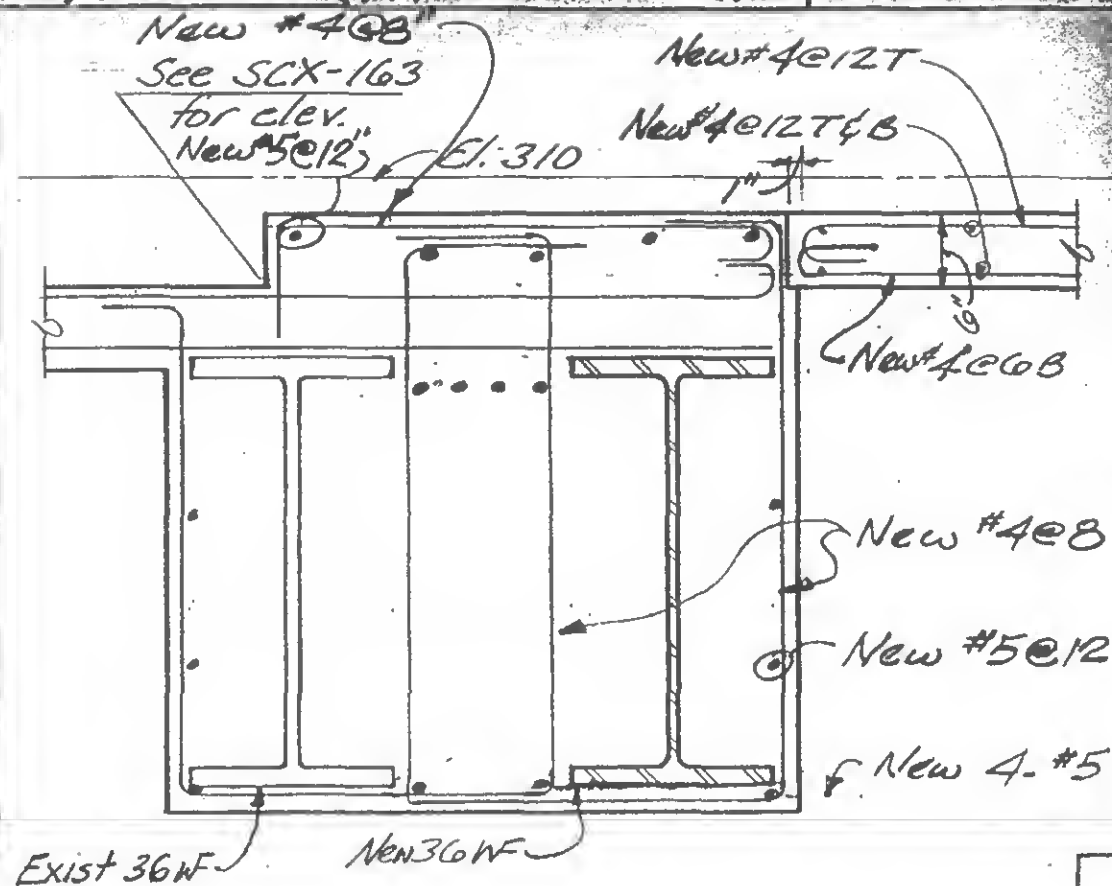
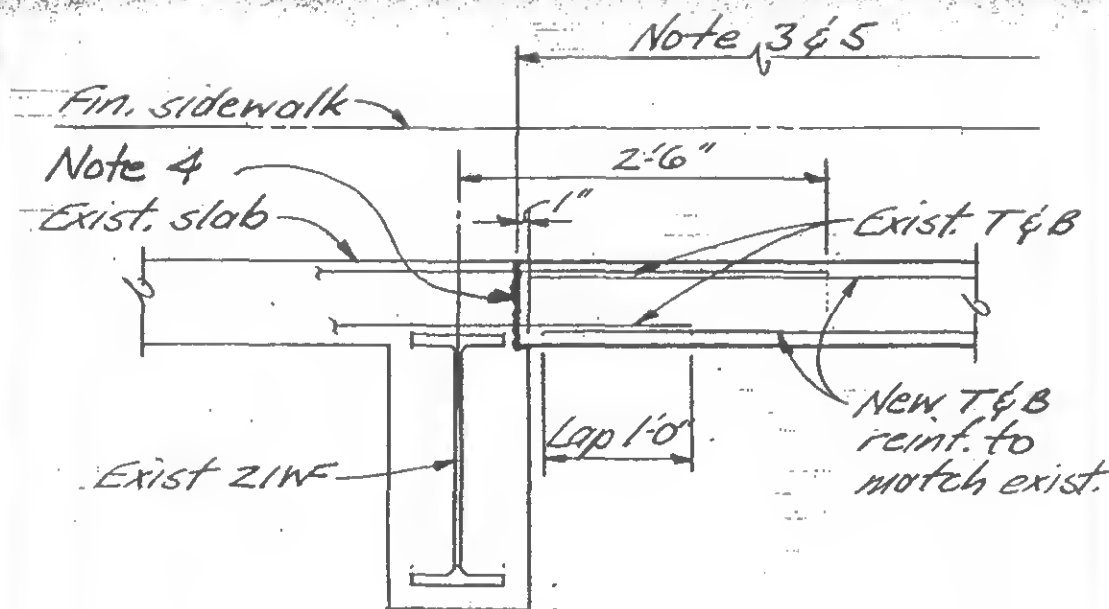
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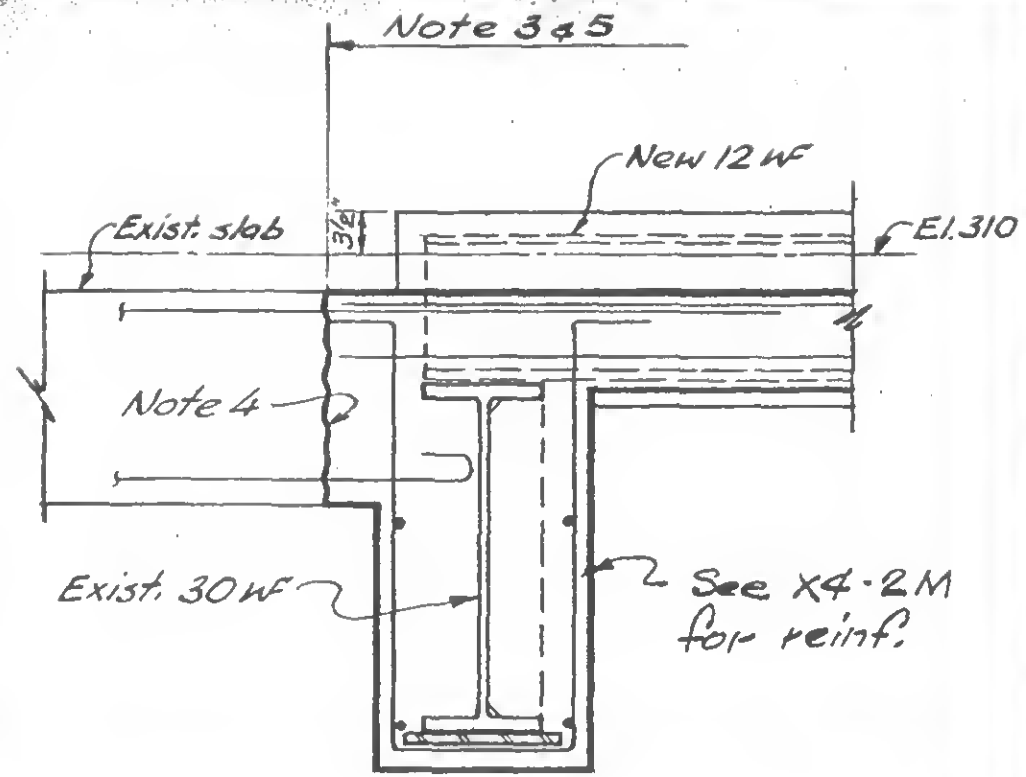
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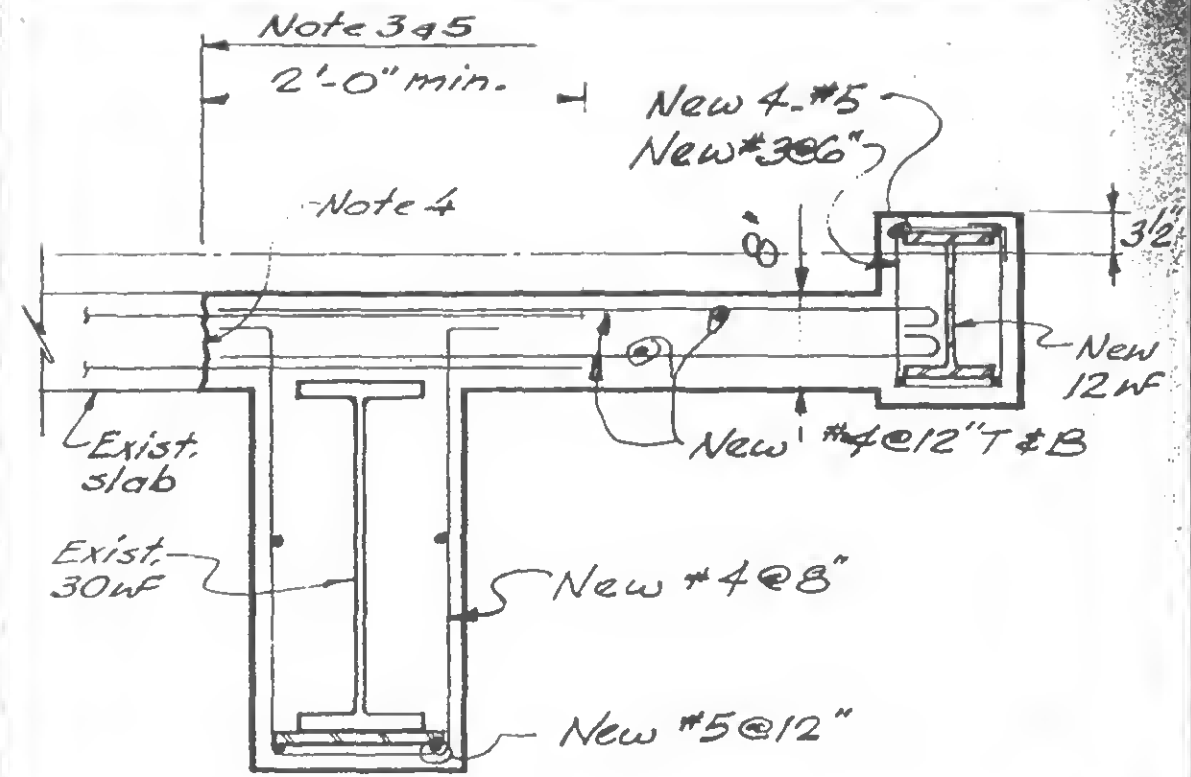
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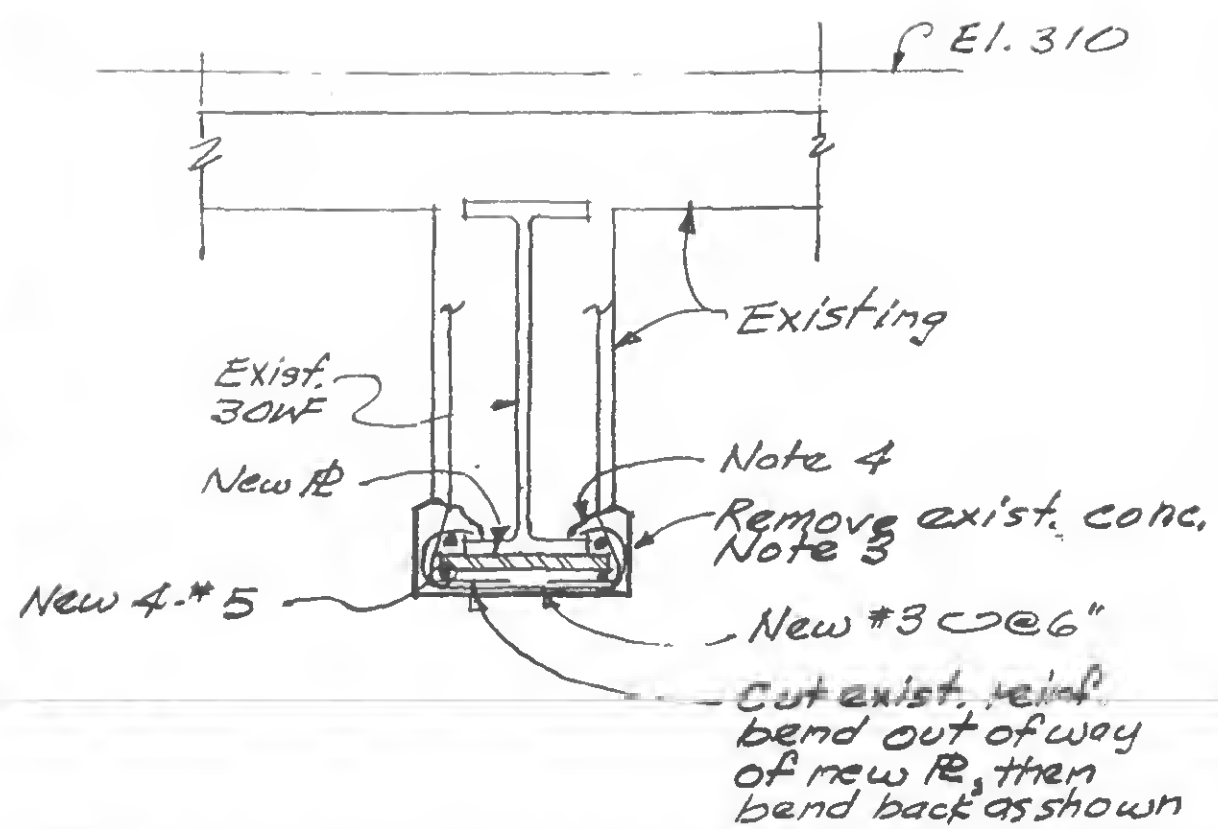
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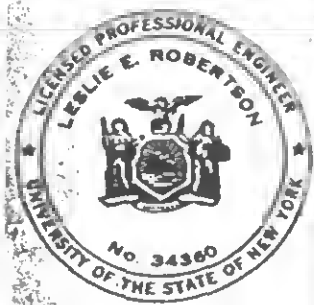


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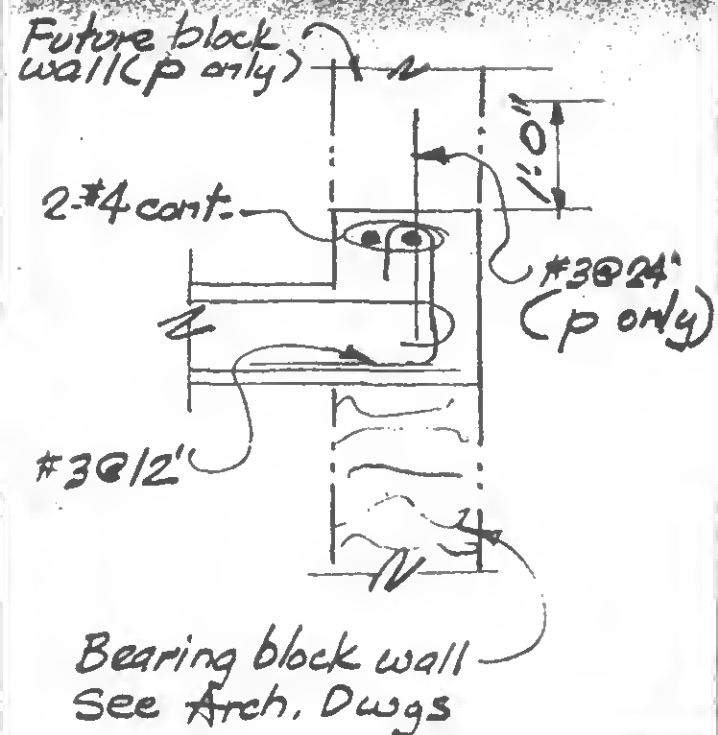
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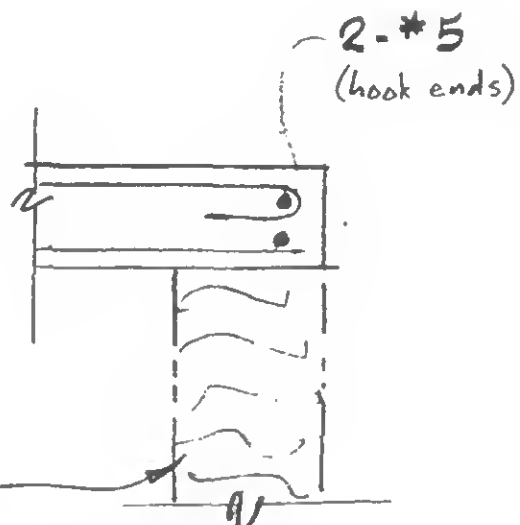


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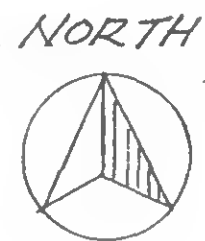
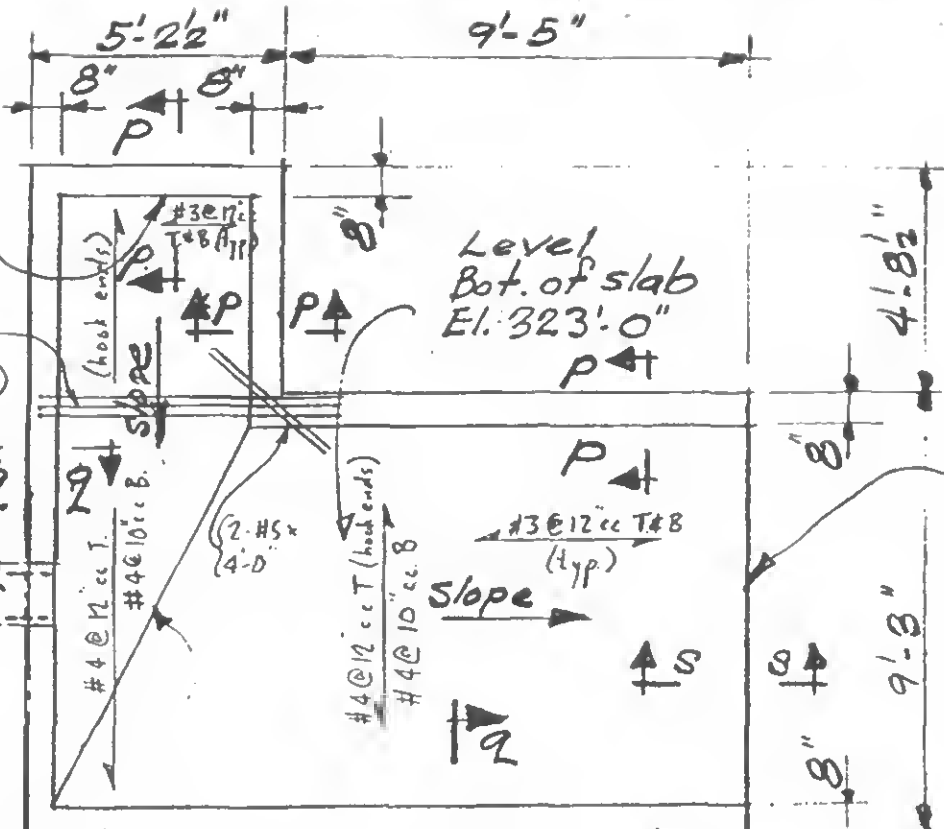


Top of slab
El. 323'-6³/₄"

Add 3-#5 T. & B.
x 7'-6" lg. (hook left end)

Future hanger

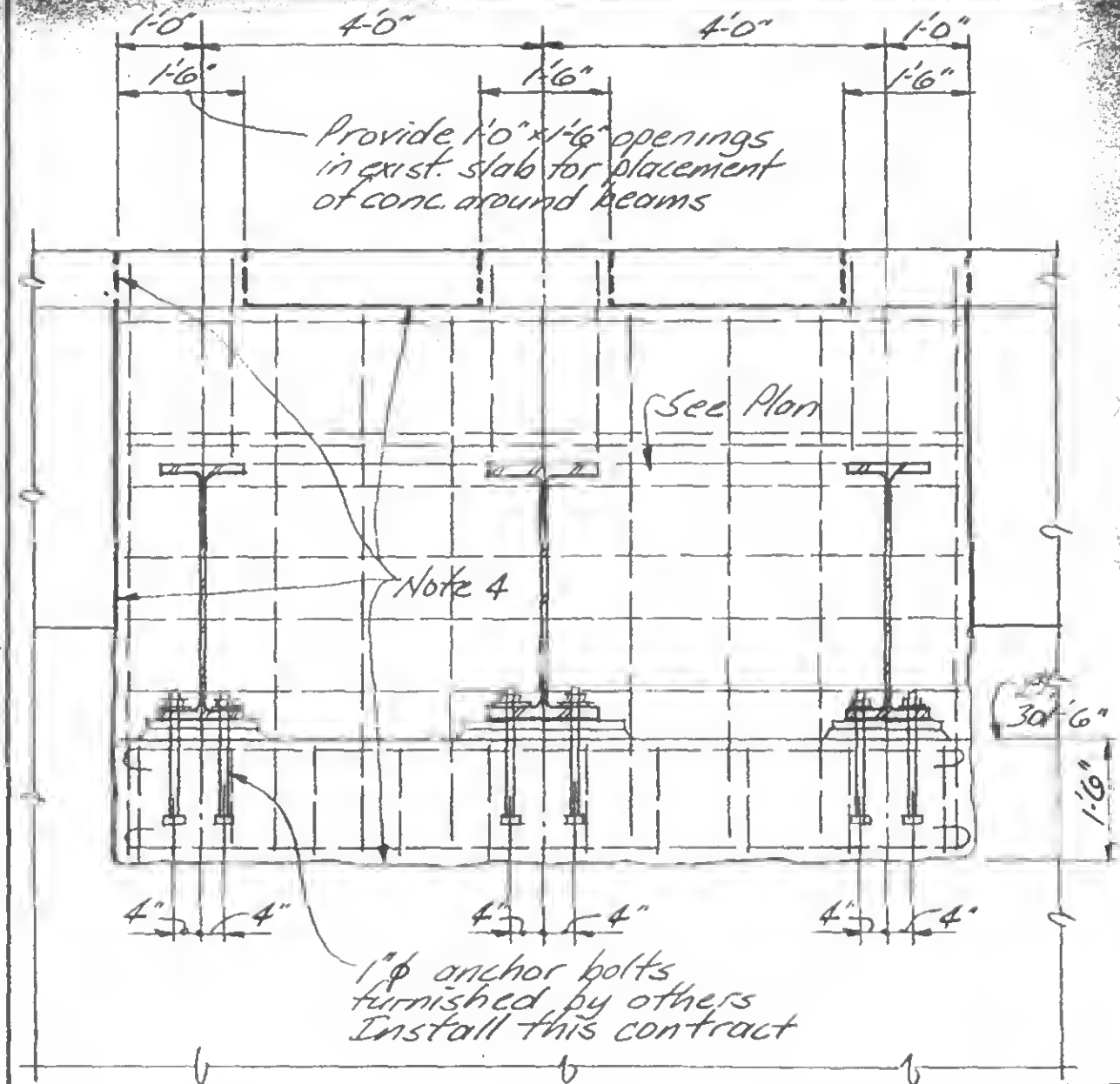
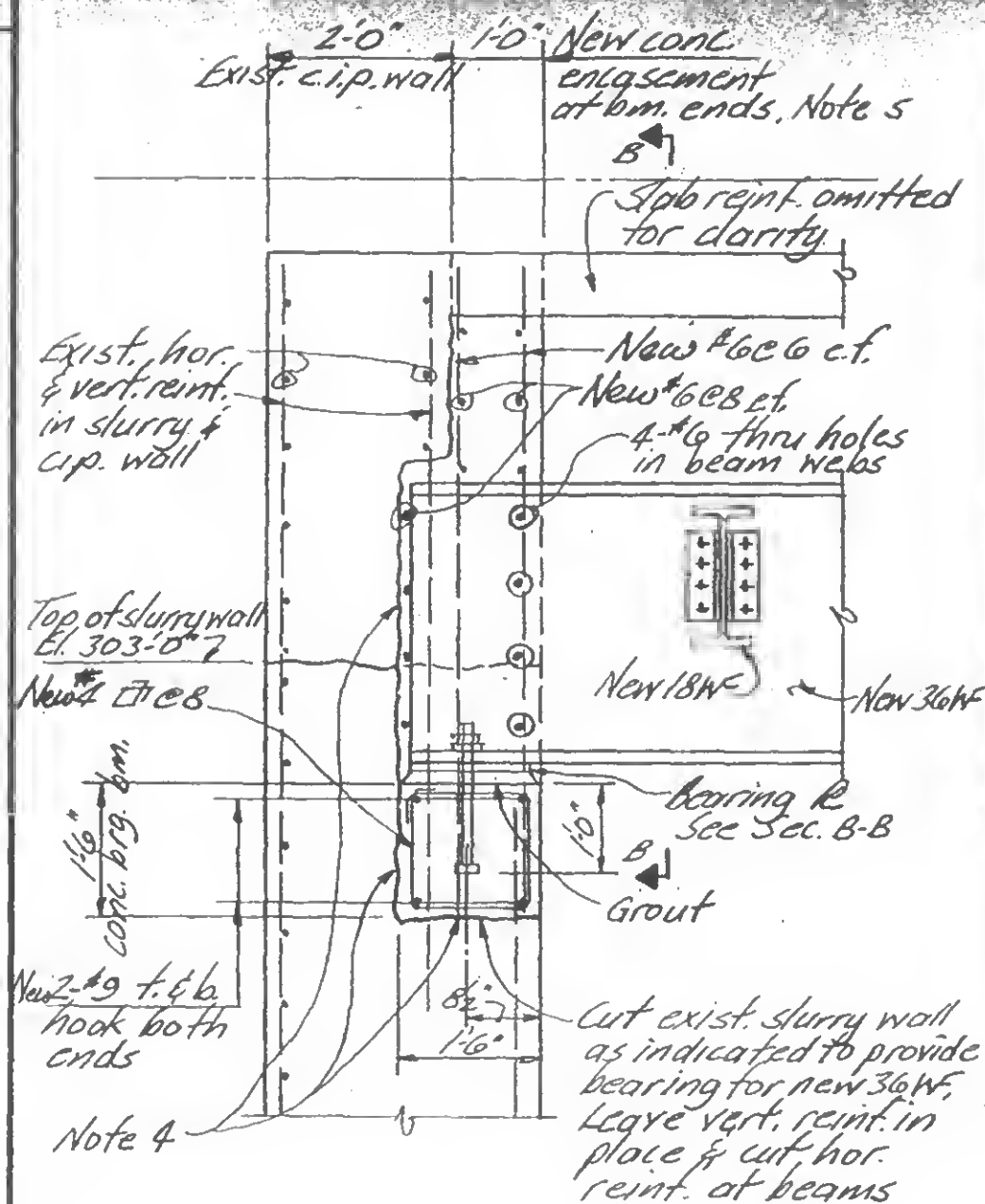
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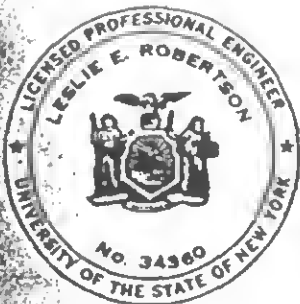
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Construction Sequence:

- Remove slurry wall, c.i.p. wall and slab as indicated to accommodate new beams. Note 3.
- Place concrete bearing beam with anchor bolts in proper location.
- Encase ends of beams after installation of new steel is complete.



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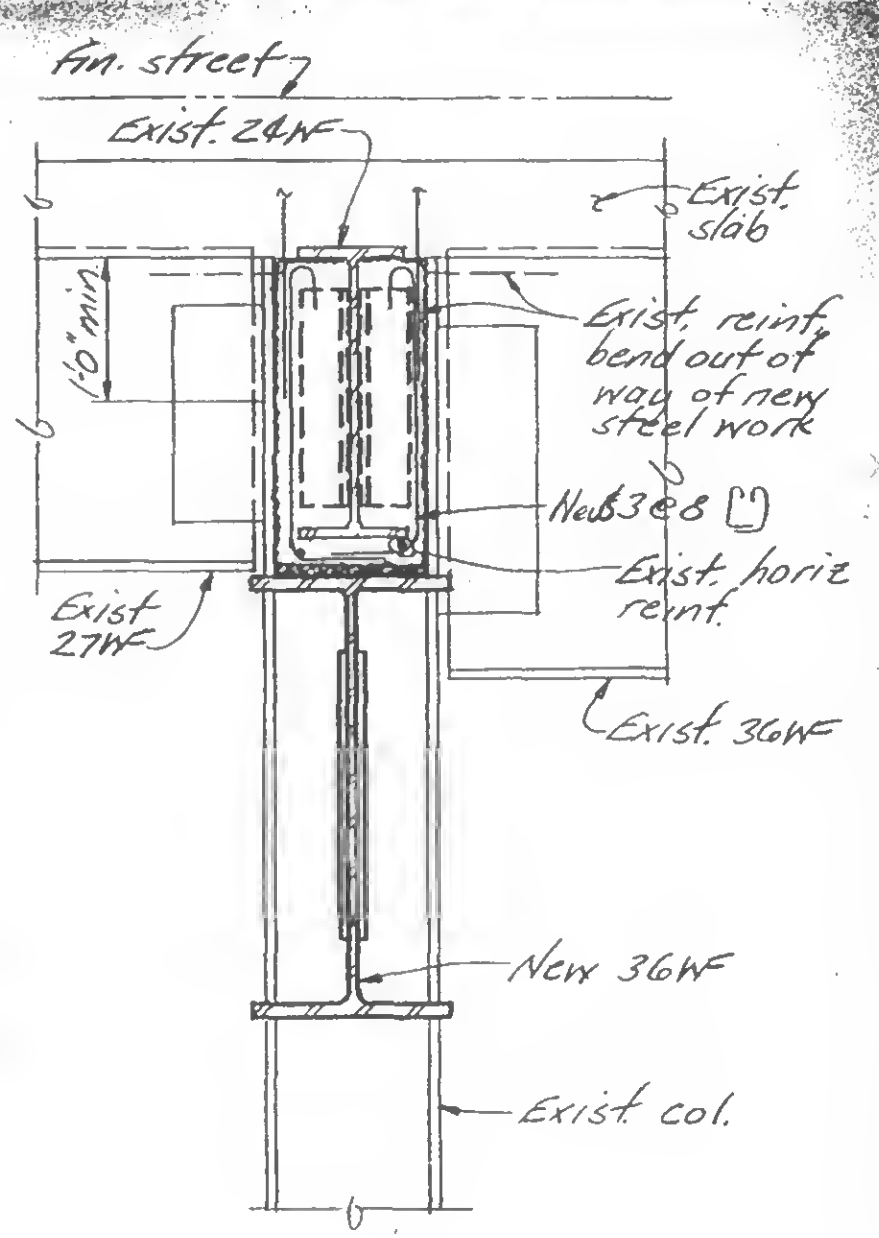
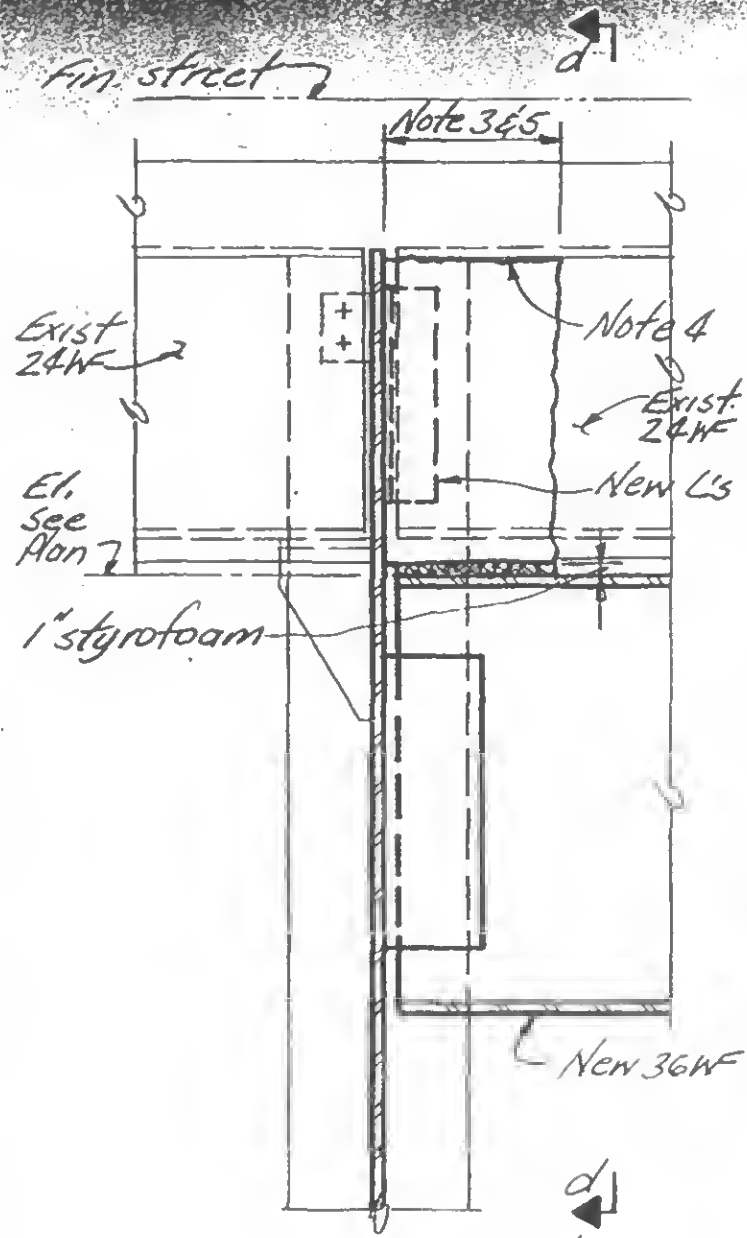
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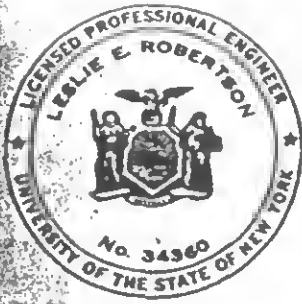
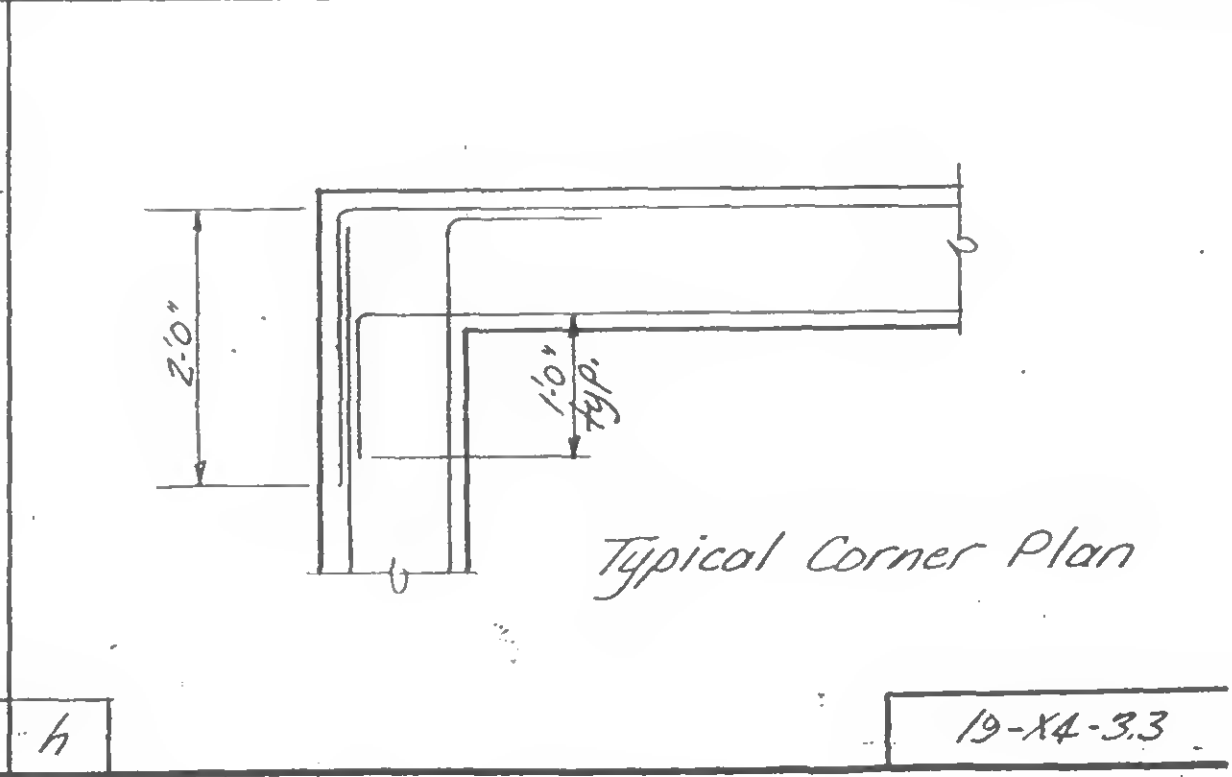
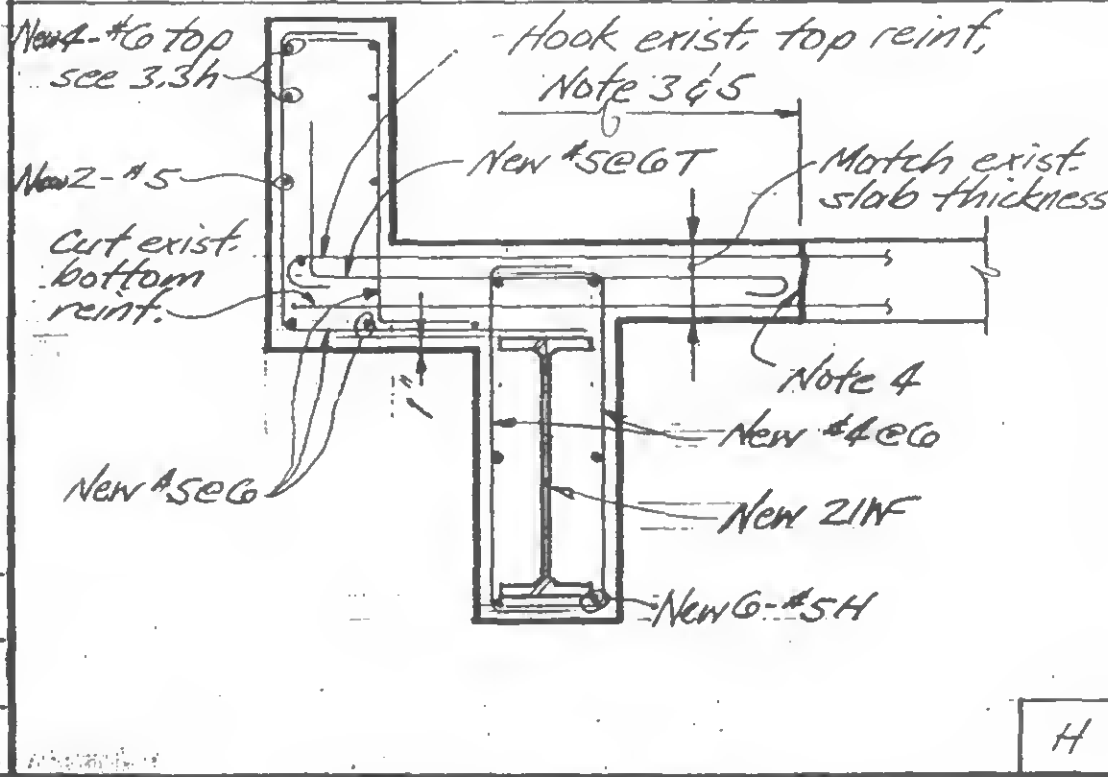
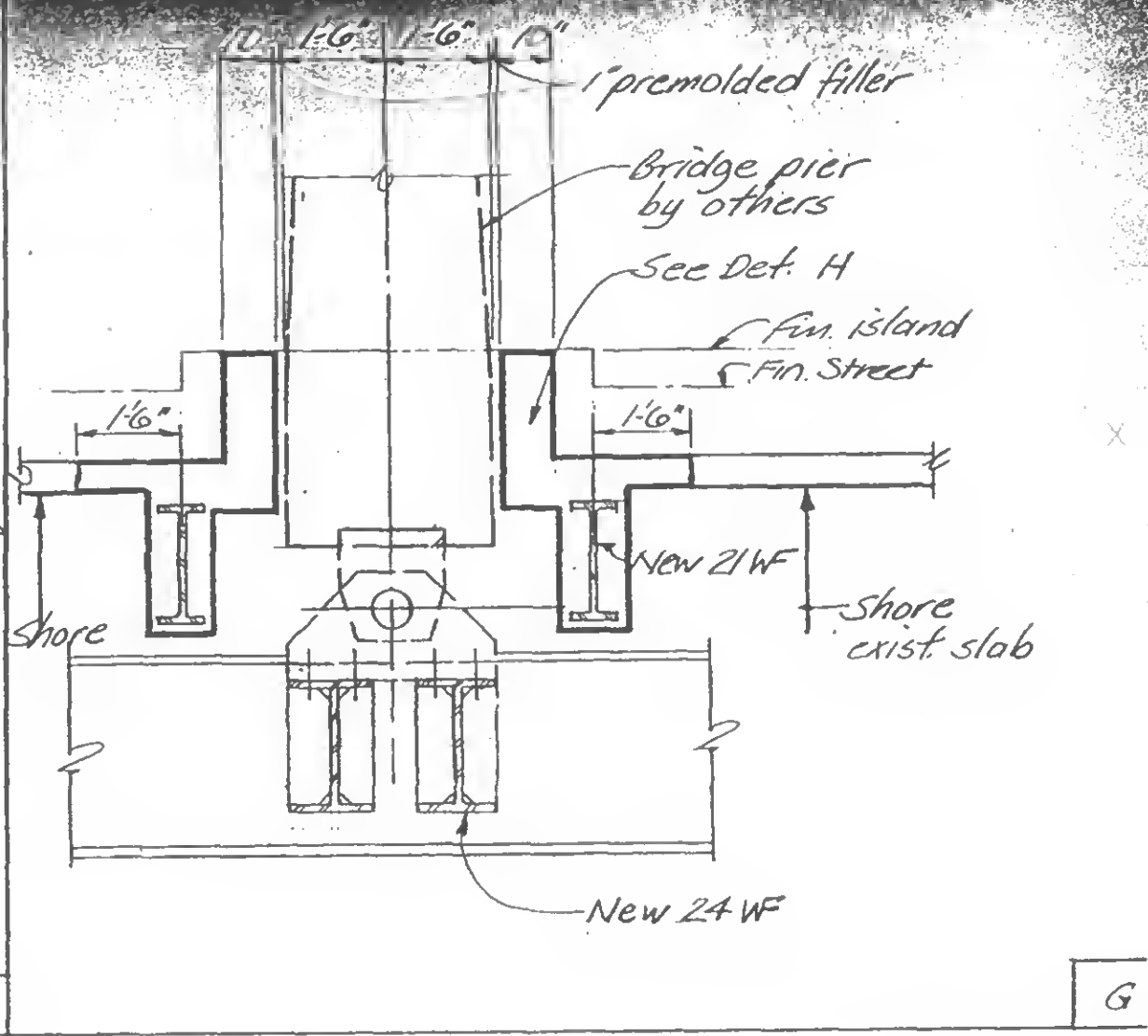
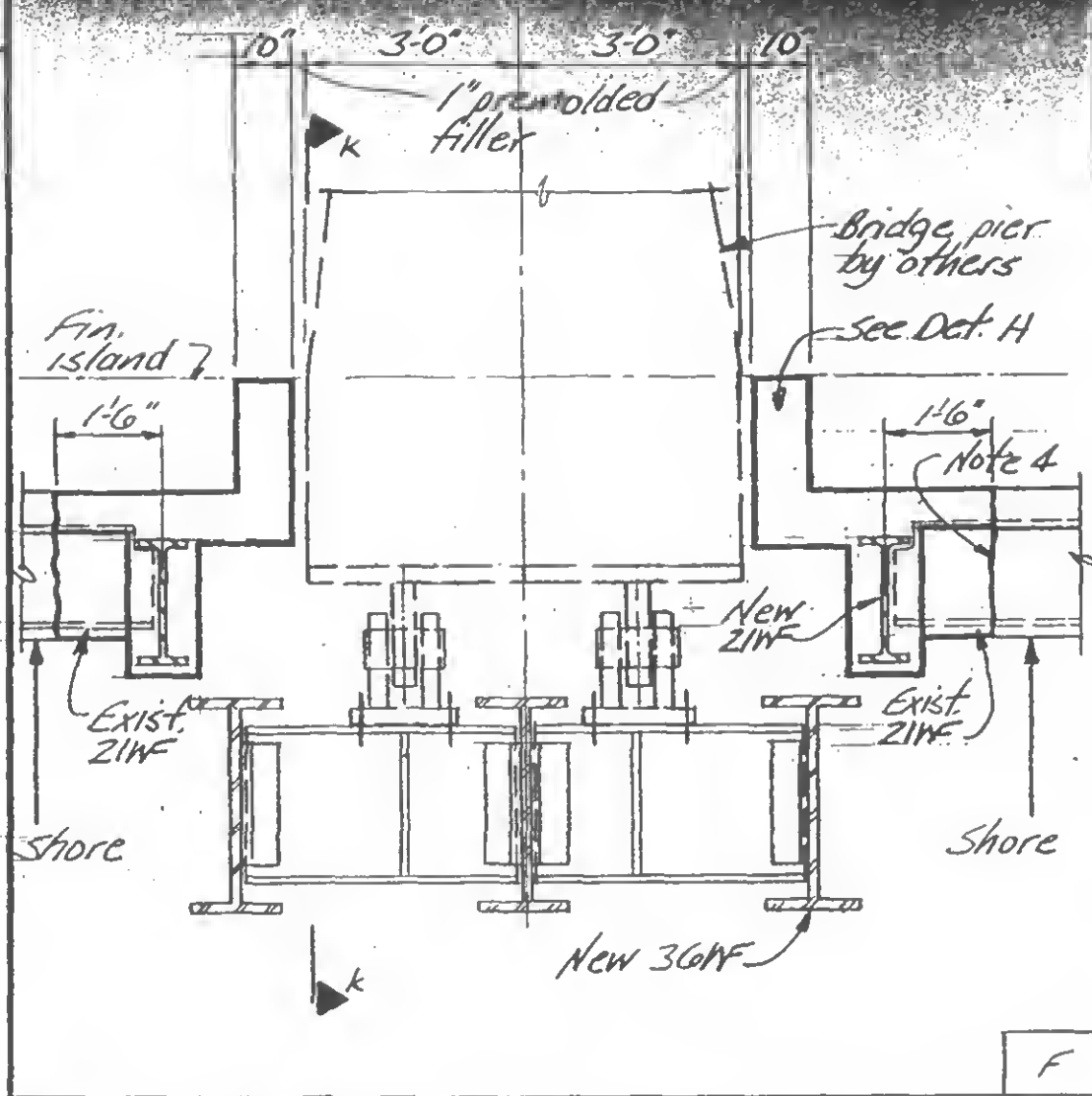
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